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المنظمة العالمية للأرصاد الجوية
世界气象组织

COMPENDIUM OF EDUCATION AND TRAINING FACILITIES
FOR METEOROLOGY AND OPERATIONAL HYDROLOGY
COMPENDIUM DES ÉTABLISSEMENTS D'ENSEIGNEMENT ET DE FORMATION
PROFESSIONNELLE EN MÉTÉOROLOGIE ET HYDROLOGIE OPÉRATIONNELLE

СПРАВОЧНИК УЧЕБНЫХ ЗАВЕДЕНИЙ В ОБЛАСТИ
МЕТЕОРОЛОГИИ И ОПЕРАТИВНОЙ ГИДРОЛОГИИ
COMPENDIO DE INSTITUCIONES DE ENSEÑANZA Y FORMACIÓN
PROFESIONAL EN METEOROLOGÍA E HIDROLOGÍA OPERATIVA

WMO/OMM/BMO – No. 240



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Secrétariat de l'Organisation météorologique mondiale - Genève - Suisse
Секретариат Всемирной Метеорологической Организации - Женева - Швейцария
Secretaría de la Organización Meteorológica Mundial - Ginebra - Suiza

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12 MARS 1997

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NOTE

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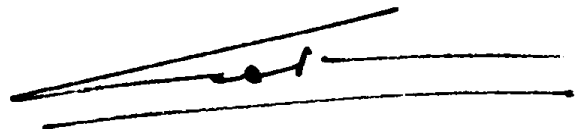
FOREWORD

In 1958, the WMO Executive Council (Executive Committee till Ninth Congress, 1983) requested the preparation and publication of a Report on Meteorological Training Facilities. That report, compiled for the purpose of assisting WMO Members in selecting suitable courses for their trainees, was duly released in 1959 and 1964, and subsequently in 1969 as WMO-No. 240. The sixth (revised) edition was issued in 1982, under the title *Compendium of Training Facilities for Meteorology and Operational Hydrology*. Given the need for issuing this publication in the other working languages of WMO, Tenth Congress (May 1987) recommended a multilingual "loose-leaf" version for future issues. As a result, more up-to-date information on Members' facilities for education and training in meteorology and operational hydrology was compiled by the WMO Secretariat in 1988 and a computer version of WMO-No. 240 was prepared, which was restructured and updated in 1995.

In this edition, the original content and presentation have been reviewed and considerably amended on the assumption that the preliminary assessment of any course requires, as a minimum, the knowledge of a few typical characteristics, such as: scientific area, targeted activity, personnel class, course emphasis, course duration and frequency, teaching language and information update. Hence, by designing and using systematic sets of key-words for each of these generic items, each course is being characterized, in a very condensed manner, by a standardized line of eight specific references, i.e. those key-words that appear as most appropriate for the overall thrust of the course concerned. In addition, the usual information about the course syllabus, educational facility, entrance qualification and any other available information, is also provided to facilitate a more thorough examination of those courses of actual interest to the user.

This seventh multilingual edition of WMO-No. 240 — *Compendium of Education and Training Facilities for Meteorology and Operational Hydrology* — is based on a computer database (Access 2.0) which contains inputs provided by Members. It is intended to update it every other year with loose-leaf amendments, while the computer-based version will be updated more often (at least twice a year), as and when the inputs of Members become available. Members are therefore encouraged to communicate to the WMO Secretariat any changes in, and/or amendments to, the data and information therein.

I am confident that this publication will prove to be highly useful as guidance material to national Meteorological and Hydrological Services and to training and educational institutions in identifying the most suitable opportunities for their prospective trainees.

A handwritten signature in black ink, consisting of a series of connected loops and strokes, positioned above the printed name and title.

(G. O. P. Obasi)
Secretary-General

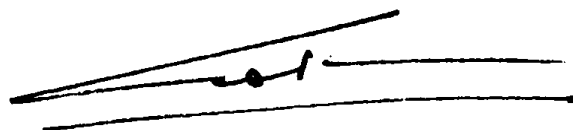
AVANT-PROPOS

En 1958, le Conseil exécutif de l'OMM (Comité exécutif jusqu'au Neuvième Congrès, en 1983) a demandé que soit établi et publié un rapport sur les possibilités de formation en météorologie. Ce rapport, qui a pour but d'aider les Membres de l'OMM à choisir des cours de formation appropriés, a été publié en 1959 et en 1964, puis en 1969 en tant que publication N° 240 de l'OMM. La sixième édition (révisée) est parue en 1982 sous le titre *Compendium of Training Facilities for Meteorology and Operational Hydrology* (Recueil de renseignements sur les possibilités de formation en météorologie et hydrologie opérationnelle). Par la suite, le Dixième Congrès (mai 1987) a recommandé que cette publication paraisse aussi dans les autres langues de travail de l'OMM. Aussi le Secrétariat de l'OMM a-t-il rassemblé en 1988 des renseignements plus récents sur les moyens de formation en météorologie et hydrologie opérationnelle dont disposent les Membres, et une version informatisée de la publication N° 240 a été restructurée et mise à jour en 1995.

Aussi bien le contenu que la forme de présentation de cette publication ont été profondément remaniés en vue de permettre une évaluation rapide des cours proposés. Pour ce faire, il fallait donner des indications sur quelques caractéristiques essentielles telles que le domaine scientifique, l'activité visée, la classe de personnel, la nature du cours, la durée et la périodicité du cours, la langue d'enseignement ainsi que la date de fourniture des informations. Ces rubriques sont désignées par des mots clefs, ce qui permet de définir de façon très concise, en une seule ligne, l'orientation générale de chaque cours. Ces informations sont complétées par les renseignements habituels sur les programmes, l'établissement d'enseignement, les conditions d'inscription, etc., pour que les intéressés puissent se faire une idée aussi complète que possible des cours proposés.

La septième édition multilingue de la publication N° 240 de l'OMM repose sur une base de données informatisée (Access 2.0) que les Membres ont alimentée. Il est prévu de la mettre à jour tous les deux ans par l'adjonction de feuilles volantes contenant des amendements, alors que la version informatisée sera actualisée plus fréquemment (au moins deux fois par an) au fur et à mesure de la réception des informations. Les Membres sont par conséquent encouragés à communiquer au Secrétariat de l'OMM toute modification concernant les données et les informations.

Je suis sûr que cette publication se révélera très utile aux Services météorologiques et hydrologiques nationaux ainsi qu'aux établissements d'enseignement et de formation professionnelle en leur permettant de choisir en toute connaissance de cause la formule la mieux adaptée selon le cas.



(G. O. P. Obasi)
Secrétaire général

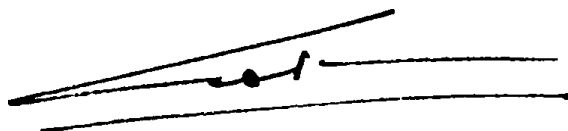
ПРЕДИСЛОВИЕ

В 1958 г. Исполнительный Совет ВМО (Исполнительный комитет до Девятого конгресса, 1983 г.) принял решение о подготовке и публикации отчета о метеорологических учебных заведениях. Этот отчет, подготовленный с целью оказания помощи странам-членам ВМО в выборе соответствующих курсов для их стажеров, был выпущен соответственно в 1959 и 1964 гг., а затем в 1969 г. в виде публикации ВМО № 240 (ВМО-№ 240). Шестое (пересмотренное) издание было опубликовано в 1982 г. под названием *Справочник учебных заведений в области метеорологии и оперативной гидрологии*. В связи с необходимостью издания этой публикации на других рабочих языках ВМО Десятый конгресс (май 1987 г.) рекомендовал в будущем издавать эту публикацию в виде многоязычного варианта со «сменными листами». Как результат, обновленная информация о заведениях стран-членов по образованию и подготовке кадров в области метеорологии и оперативной гидрологии была собрана Секретариатом ВМО в 1988 г., и был подготовлен компьютерный вариант ВМО-№ 240, который в 1995 г. был реструктурирован и обновлен.

В настоящем издании первоначальное содержание и изложение материала пересмотрены и значительно изменены, исходя из предположения, что предварительная оценка любого курса требует, как минимум, знания некоторых типичных параметров, таких, как: научная область, запланированная деятельность, класс персонала, направленность курса, продолжительность и частота курса, язык обучения, а также дата обновления информации. В результате посредством разработки и использования систематических групп ключевых слов для каждого из этих характерных параметров любой курс описывается весьма кратким образом стандартизированной строчкой из восьми конкретных групп, т.е. ключевыми словами, которые являются наиболее подходящими для общей характеристики соответствующего курса. Кроме того, обычная информация о программе курса, учебном заведении, квалификации для приема на обучение и любая другая имеющаяся информация также излагается в виде, способствующем более тщательному отбору тех курсов, которые представляют действительный интерес для пользователя.

Настоящее седьмое многоязычное издание ВМО-№ 240 — *Справочник учебных заведений в области метеорологии и оперативной гидрологии*, — основывается на компьютерной базе данных (Access 2.0), которая содержит данные, предоставленные странами-членами. Предполагается, что настоящее издание будет обновляться раз в два года путем внесения поправок, содержащихся на сменных листах, в то время как компьютерный вариант будет обновляться более часто (по крайней мере дважды в год) по мере поступления данных от стран-членов. Поэтому страны-члены призываются сообщать в Секретариат ВМО любые изменения и/или поправки к содержащимся в настоящем издании данным и информации.

Я уверен, что настоящая публикация окажется весьма полезной в качестве руководящего материала для национальных метеорологических и гидрологических служб, а также для учебных и образовательных учреждений в определении наиболее подходящих возможностей для их будущих учащихся.



(Г. О. П. Обаси)
Генеральный секретарь

PREFACIO

En 1958, el Consejo Ejecutivo de la OMM (Comité Ejecutivo hasta el Noveno Congreso, 1983) pidió que se preparara y publicara un informe sobre Instituciones de formación en meteorología. Ese informe, compilado con el fin de ayudar a los Miembros de la OMM a seleccionar cursos adecuados para sus alumnos, se editó en 1959 y en 1964, y posteriormente en 1969, como publicación WMO-Nº 240. La sexta edición (revisada) salió en 1982, con el título *Compendium of Training Facilities for Meteorology and Operational Hydrology*. En vista de la necesidad de que la publicación abarcara los otros idiomas de trabajo de la OMM, el Décimo Congreso (mayo de 1987) recomendó una versión plurilingüe en "hojas sueltas" para las futuras ediciones. Como resultado, la Secretaría de la OMM compiló en 1988 información más actualizada sobre las instituciones de enseñanza y formación profesional en meteorología e hidrología operativa de los Miembros, y se preparó una versión informatizada de WMO-Nº 240, que se reestructuró y actualizó en 1995.

En esta edición se han revisado y modificado considerablemente el contenido y la presentación originales, partiendo de que para hacer una evaluación preliminar de un curso es preciso conocer, como mínimo, algunas características típicas, como: esfera científica, actividad prevista, clase de personal, énfasis del curso, duración y frecuencia del curso, idioma de enseñanza, y actualización de la información. De ahí que, concibiendo y utilizando series de palabras clave sistemáticas para cada uno de estos elementos genéricos, cada curso se caracterice, en forma muy condensada, por una línea normalizada de ocho referencias específicas, es decir, las palabras clave que se consideran más apropiadas para los aspectos fundamentales del curso correspondiente. Además, también se proporciona la información habitual sobre el contenido del curso, la institución docente, las condiciones de admisión y cualquier otra información disponible, con objeto de facilitar un examen más completo de los cursos de verdadero interés para el usuario.

Esta séptima edición plurilingüe de OMM-Nº 240 *Compendio de instituciones de enseñanza y formación profesional en meteorología e hidrología operativa* se funda en una base de datos informatizada (Access 2.0) que contiene datos proporcionados por los Miembros. Se tiene el propósito de actualizarlo cada dos años con enmiendas en hojas sueltas, en tanto que la versión informatizada se actualizará más frecuentemente (al menos dos veces al año), cuando se disponga de datos de los Miembros. Por lo tanto, se encarece a éstos que comuniquen a la Secretaría de la OMM los cambios que se produzcan en los datos y en la información que contiene, y las modificaciones que se hayan introducido.

Confío en que esta publicación resulte verdaderamente útil como directriz para los Servicios Meteorológicos e Hidrológicos Nacionales y las instituciones de enseñanza y formación profesional al determinar las oportunidades más apropiadas para sus posibles alumnos.



(G. O. P. Obasi)
Secretario General

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PART I

Introduction

CONVENTION ADOPTED FOR THE COLOURS

The original design of the mandatory publication *Compendium of Training Facilities for Meteorology and Operational Hydrology* (WMO-No. 240) has been reviewed, giving due consideration to the rapid changes undertaken by the educational system throughout the world and to the significant progress that has been taking place in computer hardware and software during the past few years. Due consideration was given also to the large inter- and intra-country diversity with respect to the existing experience and circumstances, including the technological gap between countries, as well as with respect to the Members' preference for certain WMO communication language(s), including the less common case of a different language preference of some educational institutions from the same country.

To cope with such constraints — while maintaining unaffected (except for some editorial/language corrections) the genuine format and contents of the original inputs received from Members — a four-colour convention was designed, broadly in relation with the actual use of the WMO communication languages. Noting that some countries have designated, and used, more than one such language, the convention is more restrictive in the sense that only one colour is being assigned to each country. It should also be noted that this *colour convention* is a technical device to be used exclusively for the purposes of the present publication and has no political or other significance.

The present *Compendium of Education and Training Facilities for Meteorology and Operational Hydrology* has been extracted from an Access 2.0 database which accommodates simultaneously three WMO working languages: English, French and Spanish. Russian, the other WMO working language, has yet to be included due to technical difficulties in operating the database under the Cyrillic alphabet environment. Accordingly, the publication was divided into four Parts and colour-coded as follows: Part I: *English — Blue*, key-words and the other information in English; Part II: *French — Pink*, key-words and the other information in French; Part III: *Russian — Green*, key-words in English and (most of) the other information in Russian; Part IV: *Spanish — Yellow*, key-words and (most of) the other information in Spanish. It must be stressed, however, that this convention does not indicate that the teaching language is necessarily English, French, Russian or Spanish. For instance, the Blue code refers not only to courses given in English, but it also covers courses taught in the local languages of the various countries which prefer English as the WMO working language. Similarly, the Yellow code includes not only courses which are taught in Spanish but also courses given in Portuguese or even in English (case when priority was given to the predominant Spanish- or Portuguese-speaking environment).

Each Part consists essentially of two Chapters:

Chapter 1: Index of Courses

Chapter 2: List of Institutions and Summary of Courses

with some brief Explanatory Notes in each Chapter. It is worth noting that, while the content of these Notes is the same in all Parts, the substantive content of each Part is totally different, i.e. *the actual data/information contained in one Part does not exist in the other Parts*. The recorded information in this publication consists of 545 Courses taught in 233 Educational Institutions, from 95 Countries. The actual distribution is as follows:

	Part I — Blue	Part II — Pink	Part III — Green	Part IV — Yellow
Countries:	65	13	4	13
Institutions:	168	25	10	30
Courses:	375	68	37	65

In order to facilitate the use of the Compendium, as well as an easy operational retrieval of information from the underlying database, a specific *Course-Check-List* was designed and used consistently throughout. This standardized Course-Check-List addresses the following eight specific issues: scientific field; targeted activity; personnel class; course emphasis; course duration; course frequency; teaching language; and information validity date. For each of these generic items, a limited set of key-words was selected to streamline the information entered in the Course-Check-List so that the information provided by the various institutions remains consistent from one course to another, even in a multinational context.

At the end of each Part there is a white-page Annex consisting of a blank Course Standard Form. Copies of this form may be used, in particular when submitting *updating information* to the WMO Secretariat.

Chapter 1

INDEX OF COURSES

Explanatory Notes with respect to the meaning of the CourseID code

As the listing displayed on the next pages is arranged alphabetically by country name (English only used throughout) and in ascending order of **CourseID**, a brief description of the Database Codes designated for Countries, Institutions and Courses is given below:

- CountryID:** a three-letter index codifying the actual name of the concerned country; generic example: ABC. The actual codes (see the list of the Reporting Countries in the Table of Contents) are based on the designations made by the International Standard Organization. See *Terminology Bulletin* No. 347; United Nations, New York, 1995, UN publication, ISBN 92-1-002063-4.
- InstitutionID:** a six-character index used to identify the educational institution under whose auspices the given course is organized; generic example: ABC--1.
- CourseID:** a nine-character index used to number the courses, according to the respective institutions; generic example: ABC--1--1.

The first six characters of the **CourseID** denote the **InstitutionID**, while the first three characters of the **InstitutionID** reproduce the **CountryID**.

Index of Courses

CourseID	Course Title	("Blue" selection only)
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AUSTRALIA

AUS-1-1	Postgraduate Meteorologist Course	
AUS-1-2	Technical Officer (Observer) Training Course	
AUS-1-3	Technical Officer (Electronics) Training Course	
AUS-2-1	B.Sc. and B.Sc. Honours	
AUS-2-2	M.Sc. by thesis and coursework	
AUS-2-3	M.Sc. or Ph.D. by research	
AUS-3-1	Postgraduate Research in Meteorology	
AUS-3-2	Atmospheric Physics or Meteorology/Hydrology	
AUS-4-1	B.Sc., M.Sc. and Ph.D. in Meteorology and Oceanography	
AUS-5-1	Diploma in Atmospheric Sciences	
AUS-5-2	Bachelor of Technology (Atmospheric Science)	
AUS-5-3	M.Sc., Ph.D. Programme in Meteorology	

AUSTRIA, The Republic of

AUT-1-1	Training for professional meteorologists and observers	
AUT-2-1	Training of professional meteorologists or professional hydrologists	
AUT-3-1	Training of professional hydrologists	
AUT-4-1	Training of professional meteorologists or professional hydrologists	

BANGLADESH, The People's Republic of

BGD-1-1	Forecaster's course	
BGD-1-2	Forecaster's refresher course	
BGD-1-3	Assistant's course	
BGD-1-4	Assistant's refresher course	
BGD-1-5	Observer's course	

BOTSWANA, The Republic of

BWA-1-1	Introduction to meteorology for meteorological observers	
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BRUNEI DARUSSALAM

BRN-1-1	Observer Training Course	
BRN-1-2	Radiosonde Training Course	

CHINA, The People's Republic of

CHN-1-1	Interpretation and Application of Numerical Weather Prediction Products	
CHN-1-2	Synoptic Meteorology	
CHN-1-3	Principles of Climatology	
CHN-1-4	Agrometeorology	
CHN-1-5	Atmospheric Physics	
CHN-1-6	Radar Meteorology	
CHN-1-7	Principles of Computers	
CHN-1-8	Operating System	
CHN-1-9	Dynamic Meteorology	
CHN-2-1	Some Advanced Techniques in Numerical Weather Prediction (NWP)	
CHN-2-2	Synoptic Dynamical Meteorology leading to a Bachelor of Science	
CHN-3-1	Dynamic Meteorology	

CourseID	Course Title	("Blue" selection only)
CHN-3-2	Meteorological radar principle and system	
CHN-3-3	Satellite Communication and VSAT	
CHN-3-4	Identification and repair of meteorological instrument	
CHN-4-1	Mesoscale Meteorological Modeling	
CHN-5-1	Advanced Postgraduate Hydrologic Course	
CHN-6-1	Agricultural Meteorology	
CROATIA, The Republic of		
HRV-1-1	Training for: (a) B.Sc., professional meteorologist; (b) M.Sc. in physics-meteorology; (c) Ph.D.	
CZECH REPUBLIC, The		
CZE-1-1	Satellite Meteorology	
CZE-2-1	Hydrological Data for Water Resources Planning	
DENMARK, The Kingdom of		
DNK-1-1	Courses in meteorology	
DNK-2-1	Aeronautical meteorology	
DNK-2-2	Training of Class IV meteorological personnel	
EGYPT, The Arab Republic of		
EGY-1-1	Professional Forecaster	
EGY-1-2	Climatologist	
EGY-1-3	Numerical Weather Prediction	
EGY-1-4	Agrometeorologist	
EGY-1-5	Instruments Specialist	
EGY-1-6	Introduction to Meteorology	
EGY-1-7	Agricultural scientists	
EGY-1-8	Basic course for observers	
EGY-1-9	Surface observer	
EGY-1-10	Agricultural and Environmental Observer	
EGY-1-11	Upper Air Observer	
EGY-1-12	Synoptic Technical Assistant	
EGY-1-13	Climatology Technical Assistant	
EGY-1-14	Agrometeorology Technical Assistance	
EGY-1-15	Electronics Technician	
EGY-1-16	Mechanics Technician	
EGY-2-1	Diploma in Meteorology	
ERITREA		
ERI-1-1	Training of the Class III meteorological personnel	
ERI-1-2	Training of the Class IV meteorological personnel	
ETHIOPIA		
ETH-1-1	Training of Assistant Meteorologist, WMO Class III level	
ETH-1-2	Training of Meteorological Observer, WMO Class IV level	
FIJI, The Republic of		
FJI-1-1	Introductory Course in Meteorology	
GERMANY, The Federal Republic of		
DEU-1-1	Education and training for DWD staff - within framework of a preparatory course for civil servants	

CourseID	Course Title	("Blue" selection only)
DEU-2-1	Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.	
DEU-3-1	Hydrology Part I	
DEU-3-2	Environmental Engineering - Water Pollution Control	
DEU-4-1	Hydrology - Water engineering postgraduate course and other hydrological courses	
DEU-5-1	Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.	
DEU-6-1	Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.	
DEU-7-1	Hydrology and Water Resources	
DEU-8-1	Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.	
DEU-9-1	Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.	
DEU-10-1	Meteorology and climatology within the study in horticulture, landscape architecture and geography	
DEU-11-1	Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.	
DEU-12-1	Meteorologie Diplom-Studiengang Meteorologie	
DEU-13-1	Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.	
DEU-14-1	Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.	
DEU-15-1	Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.	
DEU-16-1	Courses in applied/forest/biometeorology for students of forestry, geography and meteorology	
DEU-17-1	Water engineering - Studies leading to "Diplom" (equivalent M.Sc.)	
DEU-18-1	Water management for tropical areas	
DEU-19-1	Hydrology, Water Resources Management and Hydraulic Engineering	
GHANA, The Republic of		
GHA-1-1	Class IV Meteorologist - Initial Training Course	
GREECE; The Hellenic Republic		
GRC-1-1	Training of Class I meteorological personnel (Meteorologists)	
GRC-1-2	Training of Class II meteorological personnel (Meteorological assistants)	
GRC-1-3	Training of Class III meteorological personnel (Technicians)	
GRC-1-4	Radar Meteorology	
GUYANA, The Republic of		
GUY-1-1	Meteorological Technician	
GUY-1-2	On-the-job training for Hydrometeorological Technicians	
HONG KONG		
HKG-1-1	Applied Meteorology Course for Forecasters	
HKG-1-2	Meteorology Course for Aviation Forecasters	
HKG-1-3	Initial Training Course for Scientific Assistants	
HUNGARY, The Republic of		
HUN-1-1	Course in Meteorology	
HUN-1-2	Postgraduate course in meteorology	
HUN-2-1	International Postgraduate Course on Hydrology	
INDIA, The Republic of		
IND-1-1	Intermediate Course (Instrumentation)	
IND-1-2	Advanced Course (Instrumentation)	
IND-1-3	Meteorological Telecommunication Operator's Course	
IND-1-4	Intermediate course in meteorological telecommunication	
IND-1-5	Advanced course in meteorological telecommunication	

CourseID	Course Title	("Blue" selection only)
IND-2-1	Basic Meteorology Course in General Meteorology	
IND-2-2	Intermediate training in general meteorology	
IND-2-3	Advanced Meteorologist Course in General Meteorology	
IND-2-4	Advanced refresher course	
IND-2-5	Training in Agricultural Meteorology	
IND-2-6	Fortran Programming, Electronic Data Processing, Archival and Data Management	
IND-3-1	Ph.D. Programme in Environmental, Earth or Marine Sciences	
IND-3-2	M.E. Irrigation and Water Management	
IND-3-3	M.E. Hydrology and Water Resources Engineering	
IND-3-4	Training on Hydrometeorological data collection	
IND-3-5	Refresher Course on "Basin Management"	
IND-4-1	M.Sc. - Meteorology	
IND-4-2	M.Tech. in Atmospheric Science	
IND-5-1	M.Sc. (Tech.) Course in Geophysics - specialization in meteorology or exploration geophysics	
IND-6-1	M.Tech. in Atmospheric Science and Technology	
IND-7-1	25th International Postgraduate Diploma and Master's Course in Hydrology. Also Ph.D. programme	
IRAN, The Islamic Republic of		
IRN-1-1	Training of Class IV meteorological personnel	
IRN-1-2	Training of Class III meteorological personnel	
IRN-2-1	M.Sc. programme, with specialization in Dynamic or Synoptic Meteorology (DM, SM)	
IRN-2-2	B.Sc. programme in physics, with specialization in meteorology	
IRN-2-3	B.Sc. programme in meteorology	
IRN-3-1	Training of Class II meteorologist	
IRN-3-2	Training of Class I meteorologist - postgraduate diploma course in meteorology	
IRN-4-1	Equivalent to M.Sc. in Synoptic or Dynamic Meteorology	
IRAQ, The Republic of		
IRQ-1-1	Forecaster course	
IRQ-1-2	Initial observer course	
IRQ-1-3	Upper-air observer course	
IRQ-1-4	Agrometeorology observer course	
IRQ-1-5	Marine observer course	
IRQ-1-6	Surface instruments technician course	
IRELAND		
IRL-1-1	Training of Meteorologists	
IRL-1-2	Training of Meteorological Officers	
IRL-1-3	Training of Assistant Meteorological Officers	
IRL-2-1	Atmospheric Physics (4th year science course)	
IRL-2-2	Introduction to the Atmosphere	
IRL-2-3	Ph.D. and M.Sc. degree by research	
IRL-3-1	(1) Postgraduate course in Hydrology. (2) M.Sc. in Hydrology	
ISRAEL, The State of		
ISR-1-1	Basic Agricultural Meteorology	
ISR-1-2	Crop-Weather Modelling	

CourseID	Course Title	("Blue" selection only)
ISR-1-3	Hydro-Meteorology	
ISR-1-4	Data Base Construction, Maintenance and Management	
ISR-2-1	Graduate and undergraduate programmes in atmospheric sciences B.Sc., M.Sc. and Ph.D.	
ISR-2-2	Training for assistant forecasters	
ISR-3-1	B.Sc., M.Sc., Ph.D. Programmes in geophysics and atmospheric sciences	
ISR-3-2	Graduate and undergraduate programmes in geography and meteorology	
ISR-4-1	Graduate and undergraduate programmes in geography with specialization in climate and weather	
ISR-5-1	Courses for students in natural sciences	
ISR-6-1	Meteorological aspects of air pollution	
ISR-7-1	Graduate courses in climatology and hydrometeorology	
ISR-8-1	Courses in agrometeorology and micrometeorological processes	
ITALY; The Italian Republic		
ITA-1-1	Computing and Remote Sensing Applications to Agrometeorology	
JAPAN		
JPN-1-1	Operational Meteorologist	
JPN-1-2	Meteorology	
JPN-1-3	Operational Hydrology - River Engineering	
JPN-1-4	Operational Hydrology - Flood Loss Prevention and Management	
JPN-1-5	Advanced technician course - Forecaster Section	
JPN-1-6	Advanced technician course - Aerology, Telemetering and Radar Sections	
JPN-1-7	Advanced technician course - Seismology and Marine Sections	
JPN-1-8	Advanced technician course - Telecommunication Section	
JPN-1-9	Meteorological Technician course	
JPN-1-10	Advanced forecaster course	
JPN-1-11	Undergraduate College Course in Meteorology	
JPN-1-12	Computer Programming	
JPN-1-13	Computer Operation	
JPN-1-14	Aviation Meteorology	
JPN-1-15	Teletype and facsimile terminals	
JPN-1-16	Forecasting	
JPN-1-17	Radiosonde System	
JPN-1-18	Seismograph	
JPN-1-19	Administrative Management	
JORDAN, The Hashemit Kingdom of		
JOR-1-1	Observation course	
JOR-1-2	Forecasting course	
JOR-2-1	General Meteorology	
KENYA, The Republic of		
KEN-1-1	Basic observers course	
KEN-1-2	Advanced observers course / Advanced technicians course	
KEN-1-3	Initial forecasters course	
KEN-1-4	Advanced forecasters course (Class II)	
KEN-1-5	Operational training course (Class I)	

CourseID	Course Title	("Blue" selection only)
KEN-1-6	Specialized course in agrometeorology	
KEN-1-7	Specialized course in hydrometeorology	
KEN-2-1	B.Sc. degree course in meteorology	
KEN-2-2	Atmospheric science course for non-meteorology students	
KEN-2-3	M.Sc. and Ph.D. degrees in meteorology	
KEN-2-4	Postgraduate Diploma course in meteorology	
KEN-3-1	Surface Water Technology	
KOREA, The Republic of		
KOR-1-1	On-the-job training course for recruiting personnel	
KOR-1-2	On-the-job training course for recruit personnel undergone KOR-1-1 Course	
KOR-1-3	Course on Theoretical Meteorology	
KOR-1-4	On-the-job training course for Class II meteorologist	
KOR-1-5	Course on Automatic Weather System (AWS)	
KOR-1-6	Computer training course for elementary class personnel	
KOR-1-7	Computer training course for technical personnel	
KOR-1-8	Course on Aeronautical Meteorology	
KOR-1-9	Course for Science Teachers	
KOR-1-10	Course on Marine Meteorology for the government official	
KOR-1-11	Course on Marine Meteorology for marine workers	
KOR-1-12	Course on Disaster Prevention Meteorology	
KOR-1-13	Course on Agricultural Meteorology	
KOR-1-14	Course on Environmental Meteorology	
KOR-1-15	Course on Automatic Weather System (AWS) for government officials	
KOR-2-1	B.Sc. in Atmospheric Sciences	
KOR-2-2	M.Sc., Ph.D. in Atmospheric Sciences	
KOR-2-3	Ph.D. in Atmospheric Sciences	
KOR-3-1	B.Sc. in Meteorology	
KOR-3-2	M.Sc., Ph.D. in meteorology	
KOR-3-3	Ph.D. in Meteorology	
KUWAIT, The State of		
KWT-1-1	Meteorological Course for Observers	
LATVIA, The Republic of		
LVA-1-1	Basic Lectures in: Meteorology; Climatology; Hydrology; Oceanography	
MALAWI		
MWI-1-1	Basic Training of Class IV Meteorological personnel (Observers and Assistants)	
MALAYSIA		
MYS-1-1	Basic Course for Meteorological Observers	
MYS-1-2	Basic Course for Marine Observers	
MYS-1-3	Training Course on Meteorological Aspects of Air Pollution	
MYS-1-4	Basic Meteorological Instrument and Climatology Course	
MYS-2-1	Hydrological instruments, observations and data collection	
MALDIVES, The Republic of		
MDV-1-1	Ab Initio and on-the-job training for Meteorological Observers	
MAURITIUS, The Republic of		

CourseID	Course Title	("Blue" selection only)
MUS-1-1	Training of Meteorological Personnel	
NETHERLANDS ANTILLES		
ANT-1-1	Meteorology course for class IV personnel	
NETHERLANDS, The Kingdom of the		
NLD-1-1	International postgraduate courses in Hydrology	
NEW ZEALAND		
NZL-1-1	Meteorologist Course	
NZL-1-2	Pacific Islands, Level III	
NZL-2-1	Hydrological Technicians Training Course	
NIGERIA, The Federal Republic of		
NGA-1-1	Meteorological Observers Course	
NGA-1-2	Meteorological course (Senior Observers course)	
NGA-1-3	Meteorological course (Weather Forecasters)	
NGA-1-4	B.Sc. in Meteorology; Class I Meteorology Course	
NGA-1-5	Postgraduate Diploma in Meteorology (WMO Class I)	
NGA-1-6	M.Sc. in Meteorology	
NGA-1-7	Ph.D. in Meteorology	
NORWAY, The Kingdom of		
NOR-1-1	Training Course for Hydrology Technicians	
OMAN, The Sultanate of		
OMN-1-1	Meteorological Training for Class IV Personnel	
PAKISTAN, The Islamic Republic of		
PAK-1-1	Initial Meteorology Course Class IV	
PAK-1-2	Preliminary Meteorology Course Class III	
PAK-1-3	Basic Forecasting Course (Class II)	
PHILIPPINES, The Republic of the		
PHL-1-1	Meteorologist Training Course	
PHL-1-2	Meteorological Observer Training Course	
PHL-1-3	Specialized Agrometeorologist Course	
PHL-1-4	Hydrological Technician Training Course	
PHL-2-1	Diploma in Meteorology	
PHL-2-2	M.Sc. in Meteorology	
PHL-2-3	M.Sc. in Physical Oceanography	
PHL-2-4	Ph.D. in Meteorology	
QATAR, The State of		
QAT-1-1	Operational Meteorological Observers, Technicians	
QAT-2-1	Aeronautical Meteorological Forecaster - WMO MET Class II	
QAT-2-2	Aeronautical Meteorological Assistant - WMO MET Class III	
ROMANIA		
ROM-1-1	Studies leading to B.Sc. Degree in Physics, speciality Meteorology - Class I	
ROM-1-2	Post-graduate Refresher Courses in Meteorology	
ROM-1-3	Postgraduate Programme leading to Ph.D. in Physics of: (a) the Atmosphere; (b) the Earth	
ROM-2-1	Studies leading to B.Sc. in Environmental Sciences	

CourseID	Course Title	("Blue" selection only)
ROM-2-2	Post-graduate course leading to M.Sc. in Environmental Planning	
ROM-3-1	Diploma Course in Energetics (Hydrologist Class I)	
ROM-4-1	Diploma Course in: (a) Hydraulic Structures, (b) Environmental Engineering	
ROM-5-1	Secondary School for class IV meteorologist, hydrologist or chemistry laboratory assistant	
ROM-5-2	Post-Secondary School for class III meteorologist or hydrologist	
ROM-6-1	Basic Training of Class IV aeronautical meteorologists	
ROM-6-2	Basic Training of Class III aeronautical meteorologists	
ROM-7-1	Refresher/Specialization Courses for Class II, III or IV meteorologists/hydrologists	
ROM-8-1	Training of Class IV meteorologists, hydrologists or chemistry laboratory assistants	
SAUDI ARABIA, The Kingdom of		
SAU-1-1	M.Sc. programme in meteorology, hydrology, environment and arid-land agriculture	
SEYCHELLES, The Republic of		
SYC-1-1	WMO Class IV personnel training	
SIERRA LEONE, The Republic of		
SLE-1-1	Training of Observers Class IV Meteorological Personnel	
SLE-1-2	Refresher Course for Senior Observers (Class III)	
SLE-1-3	On-the-job training for forecasters (Class I, II)	
SLE-1-4	Courses for non-meteorological personnel	
SINGAPORE, The Republic of		
SGP-1-1	Training course for meteorological observers/assistants (Class III)	
SGP-1-2	Software Development for Meteorology	
SLOVAKIA; The Slovak Republic		
SVK-1-1	Course for Meteorological Observers - Fundamental Meteorological Education	
SVK-1-2	Course for Meteorological Observers - Advanced Training	
SVK-1-3	Course for Meteorological Observers - Specialization	
SVK-1-4	New Techniques and Technologies	
SVK-1-5	CLICOM	
SVK-1-6	Training of Trainers	
SLOVENIA, The Republic of		
SVN-1-1	Training of junior technical personnel for the Hydrometeorological Service	
SOUTH AFRICA, The Republic of		
ZAF-1-1	B.Sc. (Atmospheric sciences - Meteorology)	
ZAF-1-2	B.Sc. Honours (Atmospheric Sciences - Meteorology)	
ZAF-1-3	M.Sc. and Ph.D. (Atmospheric Sciences - Meteorology)	
ZAF-2-1	National Diploma (Meteorology)	
ZAF-3-1	Course for weather observers	
SUDAN, The Republic of the		
SDN-1-1	Postgraduate Diploma and M.Sc. in Meteorology	
SWEDEN, The Kingdom of		
SWE-1-1	Initial Training for Meteorological Observers	
SWE-1-2	Refresher course for professional meteorologists (primarily forecasters)	
SWE-1-3	Refresher course for assistants (Class III)	
SWE-1-4	Refresher course for professional hydrologists	

CourseID	Course Title	("Blue" selection only)
SWE-1-5	Training course for application of a runoff model to river systems and river basins	
SWE-1-6	OJT and/or guidance of individual work	
SWE-2-1	Academic course for professional meteorologists (roughly equivalent to B.Sc.)	
SWE-2-2	Academic course as a basic for higher degree studies and research in meteorology	
SWE-2-3	Higher academic degree (Ph.D.) in meteorology	
SWE-2-4	Degree studies for non-meteorologists - emphasis on Atmospheric Physics	
SWE-2-5	Degree studies for non-meteorologists - emphasis on Synoptic Meteorology	
SWE-2-6	Meteorology Specialized Course	
SWE-2-7	Air Chemistry	
SYRIAN ARAB REPUBLIC, The		
SYR-1-1	Assistant forecaster's course	
TANZANIA, The United Republic of		
TZA-1-1	Course on Training of Meteorological Personnel Class IV	
TZA-1-2	Training of Meteorological Personnel	
TZA-1-3	Sandwich course for training of meteorological and agrometeorological instrument users	
THAILAND, The Kingdom of		
THA-1-1	Training of Class II meteorologists	
THA-1-2	Training of meteorological observers (Class IV)	
TURKEY, The Republic of		
TUR-1-1	Meteorology course	
TUR-2-1	Training of Class I meteorological personnel	
TUR-3-1	Basic training of observers	
TUR-3-2	Basis forecasting course	
TUR-3-3	Data processing	
TUR-3-4	Marine Meteorology	
TUR-3-5	Meteorological Telecommunication	
TUR-3-6	Electronic Instruments and Hardware	
UNITED ARAB EMIRATES, The		
ARE-1-1	Training of Class II Meteorological Personnel	
ARE-1-2	Training of Class III Meteorological Personnel	
ARE-1-3	Training of Class IV Meteorological Personnel	
UNITED KINGDOM of Great Britain and Northern Ireland		
GBR-1-1	Meteorology for Graduates	
GBR-1-2	Initial Forecasting	
GBR-1-3	Advanced Forecasting	
GBR-1-4	Extension	
GBR-1-5	Remote Sensing	
GBR-1-6	Numerical Weather Prediction Appreciation	
GBR-1-7	Meteorological Refresher	
GBR-1-8	Instrument Maintenance Course for Meteorological Personnel	
GBR-2-1	B.Sc. in Meteorology	
GBR-2-2	B.Sc. in Physics and Meteorology	
GBR-2-3	B.Sc. in Mathematics and Meteorology	
GBR-2-4	M.Sc./Diploma - Weather, Climate and Modelling	

CourseID	Course Title	("Blue" selection only)
GBR-2-5	Masters in Research (M.Res.) in Earth and Atmospheric Science	
GBR-2-6	M.Sc./Diploma in Applied and Agricultural Meteorology	
GBR-2-7	Ph.D., M.Phil. in Meteorology	
GBR-3-1	M.Sc. in Applied Meteorology and Climatology	
GBR-4-1	M.Sc. in Remote Sensing, Image processing and applications	
GBR-5-1	Dynamical Meteorology	
GBR-5-2	Meso-scale Meteorology	
GBR-5-3	Applied Hydrology	
GBR-5-4	Environmental Hydrology	
GBR-6-1	Earth science (Atmospheric processes)	
GBR-7-1	B.Sc. with Honours in physics with meteorology	
GBR-7-2	Meteorology 1	
GBR-7-3	M.Sc. in Atmospheric Science	
GBR-8-1	M.Sc. Course in Irrigation Engineering	
GBR-8-2	M.Sc. Course in Soil Conservation and Land Reclamation Engineering	
GBR-9-1	M.Sc. in Atmospheric Physics	
GBR-10-1	Environmental Science	
GBR-11-1	Environmental Science - Measurement, modelling and analysis	
UNITED STATES OF AMERICA, The		
USA-1-1	Atmospheric Science Programme: Master of Science (M.Sc.), Doctor of Philosophy (Ph.D.)	
USA-2-1	Postgraduate Programme in Meteorology and Physical Oceanography	
USA-3-1	Atmospheric Science Programme: B.Sc.; M.Sc. in Physics - Emphasis in Geophysics	
USA-4-1	Meteorology Programme: B.Sc.	
USA-5-1	Atmospheric Sciences Programme: B.Sc., M.Sc., Ph.D.	
USA-6-1	Meteorology Programme: M.Sc., Ph.D.	
USA-7-1	Atmospheric Sciences Programme: M.A., M.Sc., Ph.D.	
USA-8-1	Meteorology Programme: B.Sc., M.Sc., Ph.D.	
USA-9-1	Meteorology Programme: B.Sc.	
USA-10-1	Environmental Programme: Bachelor of Arts, M.Sc., Ph.D.	
USA-11-1	Atmospheric Science Programme: B.Sc., M.Sc., Ph.D.	
USA-12-1	M.A., M.A.T., M.A./M.S.E.S. (With School of Public and Environmental Affairs), Ph.D.	
USA-13-1	Aerospace Engineering Sciences Department: M.Sc., Ph.D.	
USA-14-1	Meteorology Programme: B.Sc.	
USA-15-1	Bachelor of Science, Bachelor of Arts in Meteorology and in Water Resources	
USA-16-1	Bachelor of Arts, B.Sc., M.Sc., Ph.D.	
USA-17-1	Meteorology Programme: B.Sc., M.Sc., Ph.D.	
USA-18-1	B.Sc. in Aeronautics-Meteorology	
USA-19-1	Meteorology Programme: B.Sc., M.Sc.	
USA-20-1	Bachelor of Arts in Science: Concentration in Meteorology; M.Sc. in Applied Geosciences	
YEMEN, The Republic of		
YEM-1-1	Meteorological Observer	
YUGOSLAVIA, The Federal Republic of		
YUG-1-1	Training for meteorological and hydrological personnel	
YUG-2-1	Training of professional meteorologists, (Dipl. Met., M.Sc. and Ph.D.)	

CourseID	Course Title	("Blue" selection only)
ZAMBIA, The Republic of		
ZMB-1-1	Meteorological Observers Course	
ZMB-1-2	Meteorological observer refresher course	
ZMB-1-3	WMO Class III Meteorological Course	
ZIMBABWE, The Republic of		
ZWE-1-1	Preparation of WMO Class II personnel	
ZWE-1-2	Training Meteorological Observers and Assistant Forecasters; WMO Class III	
ZWE-1-3	Basic Meteorological Training for Observers	

Chapter 2

LIST OF INSTITUTIONS AND SUMMARY OF COURSES

Explanatory Notes on the meaning of the main Key-words

For each country contributing to the present publication, the first heading was reserved for the “Short Name” (in English) of the country. The first paragraph contains the relevant information about the address of the first educational institution — most often the Training Unit of the concerned national Meteorological and Hydrological Service. The next paragraphs provide information on the courses being organized under the auspices of the referred institution. This entry for the first institution is followed by entries for other institutions, as required. This is followed by a listing for the next country, where the same pattern is repeated.

Each course paragraph begins with the CourseID, followed by a standardized Course-Check-List of eight key-words addressing specifically the following generic issues:

<i>Scientific Field</i>	<i>Targeted Activity</i>	<i>Personnel Class</i>	<i>Course Emphasis</i>	<i>Course Duration</i>	<i>Course Frequency</i>	<i>Teaching Language</i>	<i>Information Update</i>
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In principle, the simple reading of the actual key-words (recall that these key-words were inserted in the Course-Check-List according to the main thrust of the concerned course) should facilitate a quick evaluation of the suitability of any course in relation to the user's specific interests. The most commonly used key-words and their actual meanings are presented briefly below:

Scientific Field: a three-letter code designating five main scientific areas of direct relevance for meteorological and/or hydrological subjects, namely:

MET	Meteorology, Atmospheric Sciences and Applications which are related to the significant influence of weather and climate on many aspects of agriculture, commerce and industry; see also the “Technoclimatology” item in the <i>International Meteorological Vocabulary</i> , WMO-No. 182, 1992;
HYD	Operational Hydrology, Water Sciences and Applications which are related to the significant influence of hydrological cycle on many aspects of agriculture, commerce and industry;
MoH	Meteorology and Operational Hydrology “hybrid” Applications, including Hydrometeorology Studies and related Technoclimatology Applications;
ENV	Environmental Sciences and Applications which are related to, yet different from, those of Meteorology and Operational Hydrology proper; ENV includes climate change related applications, but not Climate Sciences;
GEO	Geophysical Sciences, particularly geophysical fluids disciplines; GEO includes Climate Studies that go beyond the MET covered “Atmospheric Climatology”.

Targeted Activity: refers to the potential area of competence to be assumed by the trainee in the future. Given the large spectrum of such areas, broad reference codes were designed, also in relation with the personnel class. There are eight such codes:

Scientific	Research and Development, Academic activities; class 1, mainly 1c;
PredictForec	Preparing main predictions and forecasts; classes 1-2, mainly 1a or 1b;
AssistForec	Assisting forecasters and/or adapting the main forecasts; classes 2-3;
Technician	Specific technical activity in support of daily operations; classes 2-3;
Observation	Operational Meteorological/Hydrological observation; classes 3-4;
InstrumEquip	Operating/maintaining instruments, telecommunication, computers; classes 1-4;
Operational	Broad designation for any regular activity within the “forecast chain”; classes 1-4;
Clhymet	ClimateHydroMeteo Application outside the “forecast chain”; classes 1-4.

Personnel Class:	is mainly a digit-only code describing the WMO classes (1, 2, 3, 4) of personnel to be trained. The class 1 personnel is further divided into three sub-classes:
1a	Graduating from a relevant university programme of minimum four years;
1b	Postgraduate training not leading to a higher university degree;
1c	Graduates undertaking a higher university degree course, master, doctorate.
Mixed-class	Combinations of the above codes are also used, for instance:
1a-1c	Training programme addressing both undergraduate and postgraduate degrees;
1-4	Brief reference for the “all classes” operational training, the package as a whole;
1a-2	Course that may be attained both by class 1a and by class 2 personnel; etc.
Course Emphasis:	is a composite, partially encrypted code of eleven characters combined in the form xxxxx-yyyyy, where:
xxxxx	addresses the <u>type of instruction</u> , namely: from the university formal education — to be referred through the prefix <i>Univ</i> , to the extra-university professional training — to be referred through the prefix <i>Prof</i> . More specifically, xxxxx is to be covered by one of the prefixes Univ or Prof, followed by one of the suffixes E, F, S — denoting <i>Education</i> , <i>Formation</i> and <i>Specialization</i> , respectively;
yyyyy	is dedicated to abbreviated words addressing either the <u>job-speciality</u> or the <u>instruction level</u> ; see the table below.

Job-speciality

<i>Aerol</i>	Aerological observation/study
<i>Aeron</i>	Aeronautical meteorology
<i>Agric</i>	Agricultural meteorology
<i>Atmos</i>	Atmospheric science and application
<i>Clima</i>	Climatology; climate sciences
<i>DataP</i>	Data processing in M & H
<i>DynaM</i>	Dynamic meteorology
<i>Elect</i>	Electronic instr/hardware
<i>Engin</i>	Engineer(ing)
<i>Envir</i>	Environmental M & H
<i>HyMet</i>	Hydrometeorology
<i>Instr</i>	Classical instruments and methods of observation
<i>Marin</i>	Marine meteorology
<i>NclPP</i>	Nuclear power plants
<i>Ocean</i>	Oceanography matters
<i>PhysM</i>	Physical meteorology
<i>Pollu</i>	Pollution in atmosphere/water
<i>Radar</i>	Radar meteorology
<i>SateM</i>	Satellite meteorology
<i>Synop</i>	Synoptic meteorology
<i>Telec</i>	Met-telecommunications
<i>Water</i>	Water related speciality

Instruction level

<i>AbIni</i>	Ab initio course training
<i>Advan</i>	Advanced training; usually biased towards academic work; contrast “Speci” below
<i>Bases</i>	Fundamental training, good similarity with syllabus from WMO-No. 258
<i>ET&R</i>	Education, training and research
<i>IDisc</i>	Inter-/multi-disciplinary course
<i>Intro</i>	Introductory course
<i>Inten</i>	Intensive course
<i>Intl</i>	International course; foreign trainees
<i>Intrm</i>	Intermediate-level course
<i>Manag</i>	Management; either in water resource or in office administration
<i>Natnl</i>	National trainees’ course
<i>OJT</i>	On-the-job training
<i>R&D</i>	Research and development activity
<i>Rfrsh</i>	Refresher, periodic training; related partially with “Advan”/“Speci” items
<i>Rsrch</i>	Mainly fundamental research in atmosphere/ocean sciences
<i>Speci</i>	Job specialization; operationally biased training; contrast with “Advan” above
<i>Varia</i>	Miscellaneous, nonspecified instruction level

For a given course, only one suffix may be selected from this twin-list of key-words.

Course Duration:	refers to the actual number of lecture-hours, days, weeks, months, trimesters, semesters or academic years required to complete the course or the educational programme. The less precise designation <i>flexible</i> is also used on occasion.
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Course Frequency:	refers to the course frequency and the codes used include self-explanatory abbreviations such as <i>Trimest</i> , <i>Semest</i> , etc. The key-word <i>Ad-hoc</i> is used to designate a training event which is not regular, but not necessarily random; rather, it signifies that training is being organized only when certain requirements appear.
Teaching Language:	refers to the actual teaching language — some 30 different national languages. Occasionally, i.e. in those cases when the teaching may be given not only in the local language but also in English, French, Russian or Spanish, the abbreviations E, F, R, S are used, respectively, as suffixes to the name of the local language.
Information Update:	is a Date/Time text indicating when the concerned inputs were produced; only the update year is displayed in the key-word line in the Country Pages, but the complete Date is available in the computer version.
Contact Address:	refers to the (major) institution under whose auspices the course or the module of courses is being organized. Obviously, for every institution there is only one address, and thus only one InstitutionID.
E-Mail/Telex/Cable:	refers, to the extent possible, to the e-mail address, but in its absence, the relevant telex number or cable code was recorded, as available.
Phone/Facsimile:	numbers were recorded, as available.

AUSTRALIA

AUS-1 Bureau of Meteorology, Melbourne
 Contact Bureau of Meteorology Training Centre
 Address: Bureau of Meteorology
 GPO Box 1289K
 MELBOURNE VIC 3001, Australia

TEL: (61-3) 9669-4558
 FAX: (61-3) 9669-4548
 E-M/tlx: Internet wmo@bom.gov.au

AUS-1-1 Key-words: MET Operational Cl.1b ProfF-Bases 40 weeks Annual English 1995

Course Title: *Postgraduate Meteorologist Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

CORE TOPICS: Observations, Codes and Instruments; Radiation; Thermodynamics and Hydrostatics; Basic Synoptic Meteorology; Satellite Remote Sensing; Dynamical Meteorology; Tropical Meteorology; Extra-Tropical Meteorology; Climatology; Clouds and Precipitation; Radar Meteorology; Mesoscale Meteorology; Numerical Weather Prediction; Forecasting the Weather; Marine Services; Aviation Services; Public Weather Services; User services and forecast simulation. In addition, the following topics are briefly covered: Antarctic Meteorology; Air Pollution; Hydrometeorology; Oceanography; Micrometeorology; The Stratosphere; Atmospheric Chemistry; International aspects of meteorology; Presentation skills; Media Skills and Regional Forecasting.

Available for overseas students, non-residential. Some operational training in Bureau of Meteorology field offices, located throughout Australia, is available on completion of the formal course work. A maximum of twenty-two students on the course.

Entry: B.Sc. major in mathematics, physics or meteorology, with sub-major in one of the others.

AUS-1-2 Key-words: MET Observation Cl.2 ProfF-Aeron 35 weeks Ad hoc English 1995

Course Title: *Technical Officer (Observer) Training Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Observation and Communication; Scientific Support Skills; Aeronautical and Electronic Observation; Climate and Consultancy; Advanced Electronic Observations I; Meteorological Information Services; Advanced Electronic Observation II; Station Inspections; Station Management.

Maximum of twelve students. Specialist courses for overseas students, non-residential. Operational training in Bureau of Meteorology field offices, located throughout Australia, on completion of formal course.

Entry: Completion of an Associate Diploma of Applied Science (Computing and Applied Physics).

AUS-1-3 Key-words: MET InstrumEquip Cl.2 ProfE-Elect 35 weeks Ad hoc English 1995

Course Title: *Technical Officer (Electronics) Training Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General Meteorology; Workshop Practices (safety, handtools, soltering); Telemetry Equipments (radiosonde, automatic weather stations); Communications (radio, facsimile); Digital Electronics (personal computer techniques, LAN Technology, Unix); Radar (principles, Plessey WF 44 radar, EEC WF 100 radar).

Maximum of twelve students.

Entry: Completion of a certificate of technology (electronics) or associate diploma of engineering (electronics).

AUS-2 Monash University, Clayton
 Contact Director
 Address: Centre for Dynamical Meteorology
 Monash University, Clayton
 VICTORIA 3168, Australia

TEL: (61-3) 9905-4438
 FAX: (61-3) 9905-3870
 E-M/tlx: cdm@cyclone.maths.monash.edu.au

AUS-2-1 Key-words: MET Scientific Cl.1a-1c UnivF-DynaM 2-4 years Annual English 1995

Course Title: *B.Sc. and B.Sc. Honours*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

B.Sc.: Introductory courses in Meteorology and Geophysical Fluid Dynamics are offered at third-year to students in the Mathematical and Physical Sciences. These subjects include: Atmospheric Science;

Dynamical Meteorology; Advanced Fluid Dynamics. An annual field trip provides experience with a range of Meteorological Instruments and the opportunity to relate Observations to the material covered in lectures.

B.Sc. Honours: A fourth-year Honours Programme in Meteorology and Geophysical Fluid Dynamics may be taken within Applied Mathematics. Topics include: Advanced Dynamical Meteorology; Time Series and Data Analysis; Waves in Fluids; A range of Basic Mathematical Methods topics. Students are encouraged to take M.Sc. coursework topics as part of their Honours Programme thereby greatly broadening the range of available topics (see M.Sc. listing below). A minor Research Project in Meteorology is undertaken also.

Duration: B.Sc., three years; B.Sc. Honours, a fourth year. Starting date: B.Sc., B.Sc. Honours by thesis and coursework programmes start late February or early July each year.

Entry: B.Sc.: Victorian Certificate of Education or its equivalent with passes in mathematics, physics and chemistry. B.Sc. (Honours): A credit average or equivalent at third-year.

AUS-2-2 Key-words: MET Scientific Cl. 1c UnivS-DynaM 1-2 years Annual English 1995

Course Title: *M.Sc. by thesis and coursework*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

M.Sc. by thesis and coursework: An M.Sc. comprising 67% research thesis and 33% coursework is offered. The coursework topics include: Synoptic Meteorology Laboratory; Dynamical Meteorology of the Tropics; Atmospheric Boundary Layer; Numerical Weather Analysis and Prediction; Cloud Physics and Convection; Radiative Transfer and Remote Sensing; Air Pollution and Modelling.

Duration: M.Sc. by thesis and coursework, 18 months. Starting date: M.Sc. by thesis and coursework programmes start late February or early July each year. Entry into the M.Sc. and Ph.D. programmes requires the previous completion of honours at an approved institution at 2A level or better in mathematics, physics, computer science, parts of engineering or physical geography. A candidate with insufficient preparation or without an honours degree would be required to take M.Sc. preliminary coursework and achieve passes at the 75% level before continuing research.

Entry: M.Sc.: An honours degree at 2A level or better.

AUS-2-3 Key-words: MET Scientific Cl. 1a-1c UnivS-Rsrch 1,5-4years Annual English 1995

Course Title: *M.Sc. or Ph.D. by research*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

M.Sc. and Ph.D. by research. Supervision is available in a wide range of areas, and may include the full range of theoretical work, computer simulation, laboratory experiments, and field observation. Graduate study is supported by a range of specialist courses and seminars. Students may be offered joint supervision with an associate supervisor from the Bureau of Meteorology, CSIRO Division of Atmospheric Research, or the Cooperative Research Centre for Southern Hemisphere Meteorology.

Duration: M.Sc. by research, two years; Ph.D., three years. Starting date: M.Sc. and Ph.D. programmes may start at any time. Entry into the M.Sc. and Ph.D. programmes requires the previous completion of honours at an approved institution at 2A level or better in mathematics, physics, computer science, parts of engineering or physical geography. A candidate with insufficient preparation or without an honours degree would be required to take M.Sc. preliminary coursework and achieve passes at the 75% level before continuing research.

Entry: M.Sc. and Ph.D.: An honours degree at 2A level or better.

AUS-3 Murdoch University, Western Australia
 Contact: Secretary
 Address: Board of Research and Postgraduate Studies
 Murdoch University
 Murdoch, WESTERN AUSTRALIA 6150

TEL: (61-0) 9332-2211
 FAX: (61-0) 9332-2507
 E-Mail: AA 92711

AUS-3-1 Key-words: MET Scientific Cl. 1b UnivS-Rsrch Flexible Annual English 1988

Course Title: *Postgraduate Research in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Postgraduate students are normally admitted in February each year although applications for admission close in the preceding October.

Entry: B.Sc. Honours or equivalent.

AUS-3-2 Key-words: GEO Operational Cl. 1a UnivE-Atmos 3-4 years Annual English 1988

Course Title: *Atmospheric Physics or Meteorology/Hydrology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

For B.Sc: 3 years full time; for B.Env.Sci.: 4 years full time. Starting date and frequency: Undergraduate admission to University is available at the beginning of each teaching semester, i.e. normally February, or July.

Entry: University admission.

AUS-4	Flinders University of South Australia	TEL:	(61-0) 8275-3911
Contact	Professor of Meteorology	FAX:	(61-0) 8276-8213
Address:	Institute of Atmospheric and Marine Sciences	E-M/lix:	AA89624 FLINDU
	Flinders University of South Australia		
	Bedford Park, SOUTH AUSTRALIA, 5042		

AUS-4-1 Key-words: GEO Scientific Cl. 1a-1c UnivF-ET&R 3-4 years Annual English 1988

Course Title: *B Sc., M.Sc. and Ph.D. in Meteorology and Oceanography*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

FIRST YEAR: Geophysics and Hydrology; Meteorology and Oceanography; Physics; Chemistry; Mathematics.

SECOND YEAR: The Weather Forecast; Oceanography; Hydrology and Soil Science; Meteorology and Climatology; Meteorological, Oceanographical and Hydrological Measurements; Physics; Mathematics; Computing.

THIRD YEAR: Dynamical and Physical Oceanography; Dynamical Meteorology; Micrometeorology and Climatology; Radiation in the Atmosphere; Weather Forecast; Meteorological and Oceanographical Measurements and Data Analysis; Mathematics; Computing.

Programmes of B.Sc. (Honours) are drawn from topics offered in various Schools of the University, including Earth Sciences, Mathematical Science, Physical Sciences and (optionally) biological sciences. The higher degrees of M.Sc. and Ph.D. may be awarded as the result of postgraduate research studies, as part of the activities of the Flinders Institute for Atmospheric and Marine Sciences. Level, duration: B.Sc. three years (B.Sc. Honours is a 4th year); M.Sc. two years; Ph.D. three years. Starting date and frequency: B.Sc. March of every year. M.Sc. and Ph.D. on application.

Entry: For B.Sc. degree: University entrance standard; for M.Sc. and Ph.D. degrees: Graduate in appropriate science subjects, including mathematics.

AUS-5	Macquarie University, Sydney	TEL:	(61-2) 850-8415
Contact	School of Earth Sciences	FAX:	(61-2) 850-8428
Address:	Macquarie University	E-M/lix:	Richard.deDear@mq.edu.au
	SYDNEY, New South Wales, 2109		
	Australia		

AUS-5-1 Key-words: GEO Operational Cl. 1a-2 UnivE-Atmos 1 year Annual English 1995

Course Title: *Diploma in Atmospheric Sciences*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The diploma in Atmospheric Studies is a two-semester programme in Climate Studies, Theoretical and Applied Meteorology. There are two strands in the Atmospheric Sciences Diploma: Strand A - Atmospheric Sciences, and Strand B - Climate Studies. STRAND A, Core Courses include: Earth Science Project - Atmospheric Sciences; Climate Modelling; Boundary Layer Processes; Air Pollution Control and Assessment. Electives include: 2 units from Advanced Meteorology; Remote Sensing Applications in Atmospheric Science; Hydrology and other electives. STRAND B, Core Courses include: Climate Modelling; Remote Sensing Applications in Atmospheric Sciences; Air Pollution Control and Assessment; Electives include: 2 units from Advanced Meteorology; Boundary Layer Processes; Hydrology and other electives.

Strand A is suitable for students with a good background in Atmospheric Sciences or a related topic. Strand B is available for suitably qualified students with a more limited background knowledge of the subject. To obtain the Diploma, a student must have completed eight units of formal course work in either Strand A or Strand B, and have achieved a cumulative weighted average mark of 50% or better in the course work. All requirements for the Diploma should be completed in not more than two calendar years, including leaves of absences. Credits earned for this programme may also be used in satisfying part of the

requirements for an M.Sc. in Geosciences or Ph.D. (Meteorology) degree for students who demonstrate superior performance in the Diploma.

Entry: B.Sc. Physics, mathematics, meteorology, climatology or other appropriate disciplines.

AUS-5-2 Key-words: GEO Clhymet Cl. 1a-2 UnivF-Atmos 3 years Annual English 1995

Course Title: *Bachelor of Technology (Atmospheric Science)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

FIRST YEAR: Mathematics; Computing and Information Systems; Physics; Electronics; Statistics; Chemistry; Global Crises - Technology and Survival. SECOND YEAR: Mathematics; Atmosphere, Weather and Climate; Physics; Numerical Analysis; Physical Chemistry; Applied Climatology. THIRD YEAR: Mathematical Models; Boundary Layer Meteorology; Differential Equations; Technology Management; Global Climates; Special Interest Seminars: Dynamic and Physical Meteorology or Computing and Information Technology.

An Honours programme is available. It includes both a Research Project culminating in a short thesis and a variety of Coursework aimed at deepening and broadening the three-year degree.

The Atmospheric Science course offered under the Bachelor of Technology degree is designed to meet the demand for technological training in meteorology and climatology. Macquarie University has the largest group of meteorologists and climatologists in Australia. Teaching and research into climatic systems has an excellent record extending over more than 20 years. Students will undertake work experience with at least one employer. The Bachelor of Technology in Atmospheric Science, the only one of its kind in NSW and one of the few in Australia, is approved by the Commonwealth Bureau of Meteorology as a lead into the Bureau's own training courses. The course includes instruction on the use of modern computer displays to track the weather on an hour-by-hour basis and the use of models to predict the way climate may change. Teaching draws upon the research excellence and highly developed programme in the School of Earth Sciences, as well as from the government-funded Climatic Impacts Centre at the University. All academic staff have close collaborative links with many Divisions of the Commonwealth Scientific and Industrial Research Organisation (CSIRO), government departments and private companies.

Entry: Admission will be offered to students with a good grounding at Year 12 (final year of secondary of high school) in sciences and mathematics. Students who meet Year 12 requirements but lack the science and mathematics background should contact the above office for further advice.

AUS-5-3 Key-words: MET Scientific Cl. 1c UnivF-ET&R 2-4 years Annual English 1995

Course Title: *M.Sc., Ph.D. Programme in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The degrees are awarded as the result of postgraduate research studies. They are assessed by thesis only. Research topics include those from Boundary Layer Meteorology and Climate and may involve field work, numerical modelling or theoretical studies.

Postgraduate students are admitted twice each year. M.Sc. takes a normal minimum of two years; Ph.D. three years.

Entry: Graduate in appropriate science subjects.

AUSTRIA, The Republic of

AUT-1	Central Office for Meteorology and Geodynamics, Vienna	TEL:	(43-1) 365 670
Contact	Zentralanstalt für Meteorologie und Geodynamik	FAX:	(43-1) 369-1233
Address:	Hohe Warte 38, A-1190 WIEN, Austria	E-M/tlx:	13.18.37

AUT-1-1 Key-words: MET Operational Cl.1b-4 ProfF-Bases Flexible Ad hoc German 1995

Course Title: *Training for professional meteorologists and observers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Central Office for Meteorology and Geodynamics: General Meteorology; Meteorological Satellite Data; Meteorological Instruments; Special Forecasting and Forecasting Research; Agricultural Meteorology; Hydrometeorology and Hydrology; Bioclimatology; Administration; Meteorology applicable to national economic development; Telecommunications; Meteorological Librarianship.
Meteorological station at the aerodrome, Vienna-Schwechat: Aeronautical Meteorology; Telecommunications.

Duration: according to prior bilateral negotiations. Frequency: irregular, the training is on bilateral agreement basis.

Entry: Completed study at a university, for the training of professional meteorologists. Completed high school, or equivalent education, for the training of observers.

AUT-2	University of Vienna	TEL:	(43-1) 365 670
Contact	Institute for Meteorology and Geophysics	FAX:	(43-1) 369-1233
Address:	of the University of Vienna Hohe Warte 38, A-1190 WIEN, Austria CC: University of Vienna	E-M/tlx:	13.18.37

AUT-2-1 Key-words: MoH Operational Cl.1a UnivF-Bases 4 years Biennial German 1995

Course Title: *Training of professional meteorologists or professional hydrologists*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General Meteorology; Dynamic Meteorology; Physical Meteorology; Synoptic Meteorology; Climatology; Meteorological Data-Processing; Meteorological Instruments; Applied Meteorology (Biometeorology, Agrometeorology, Technical Meteorology); Boundary Layer Meteorology; Hydrometeorology; Atmospheric Optics; Atmospheric Electricity; Satellite Meteorology.

Frequency of course: every winter term. More specialized courses are held approximately every second year.

Entry: Completed high school, or equivalent education.

AUT-3	Technical University of Vienna	TEL:	
Contact	Institute for Hydrology	FAX:	
Address:	of the Technical University of Vienna Karlsplatz 13 A-1040 WIEN, Austria	E-M/tlx:	

AUT-3-1 Key-words: HYD Operational Cl.1a UnivF-Bases 4 years Biennial German 1995

Course Title: *Training of professional hydrologists*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General Hydrology; Technological Hydrology; Engineering Hydrology; Hydrology of Alpine Catchments; Hydrometry; Environmental Hydrology.

Frequency of course: every winter term. More specialized courses are held approximately every second year.

Entry: Completed high school, or equivalent education.

AUT-4 **University of Innsbruck**
Contact University of Innsbruck
Address: Schopfstrasse 41
 A-6020 INNSBRUCK, Austria

TEL:
FAX:
E-M/tlx:

AUT-4-1 Key-words: MET Operational Cl. 1a UnivF-Bases 4 years Biennial German 1995

Course Title: *Training of professional meteorologists or professional hydrologists*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General Meteorology; Dynamic Meteorology; Physical Meteorology; Synoptic Meteorology; Climatology; Meteorological Instruments; Glaciology.

Frequency of course: every winter term. More specialized courses are held approximately every second year.

Entry: Completed high school, or equivalent education.

BGD-1	Meteorological Training Institute, Meteorological Complex, Agargaon	TEL: (880-2) 816 634
Contact	Bangladesh Meteorological Department	
Address:	Abhawa Bhaban, Agargaon	FAX: (880-2) 818 230
	DHAKA - 1207	
	Bangladesh	E-Mtx: METEOR, DHAKA
BGD-1-1	Key-words: MET Observation Cl.4 ProfF-Synop 24 weeks Biannual English 1998	
Course Title: <i>Class IV Observer's Course</i>		
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):		
Physics; Mathematics; General Meteorology; Meteorological Instruments; Codes and Observations; Pilot Balloon Work; Plotting of Weather Maps; Tabulation and Compilation of Data; Organization; Earth Science, Climatology.		
Starting date and frequency: on the average of twice a year: 1st week of January and July. No tuition fees. A maximum of 10-12 students per course. Foreign students are accepted.		
Entry: Higher Secondary Certificate Examination (science) with Physics and Mathematics.		
BGD-1-2	Key-words: MET PredictForec Cl.2 ProfS-Rfrsh 35 weeks Ad hoc English 1998	
Course Title: <i>Class III Assistant's Course</i>		
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):		
Physics; Mathematics; General Meteorology; Meteorological Instruments; Codes and Observations; Pilot Balloon Work; Plotting of Weather Maps and Analysis; Organization; Earth Science; Climatology.		
On the average once a year: 2nd week of January. No tuition fees A maximum of 10-15 students per course. Foreign students are accepted.		
Entry: Graduation degree in science with Physics and Mathematics.		
BGD-1-3	Key-words: MET Forec Cl.2 ProfF-Bases 52 weeks Annual English 1998	
Course Title: <i>Class II Forecaster's Course</i>		
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):		
Physical Meteorology; Synoptic Meteorology; Dynamic Meteorology, Climatology, Physical Oceanography; Earth Science; Hydrology; Meteorological Instruments and Methods of Observation; Classroom lectures, observations; Plotting and analysing weather observations; Weather map discussion and writing forecasts and warnings.		
On the average once a year: 2nd week of January. No tuition fees. A maximum of 10-15 students per course. Foreign students are accepted.		
Entry: Postgraduate degree in Science or Graduation degree in Science with Physics and Mathematics. Sufficient knowledge in operational meteorology.		

BOTSWANA, The Republic of

BWA--1	Botswana Meteorological Services	TEL:	(267) 356 284
Contact	Director, D.M.S.	FAX:	(267) 356 282
Address:	Meteorological Service	E-M/tx:	2533WITHER BD
	P.O. Box 10100		
	GABORONE, Botswana		

BWA--1--1 Key-words: MET Observation Cl.4 ProfF-Bases 7 months Annual English 1988

Course Title: *Introduction to meteorology for meteorological observers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Maths: Arithmetic; Trigonometry; Algebra; Geometry. Physics: Mechanics; Heat; Optics. Meteorology: Composition of the Atmosphere; Sun's Energy in the Atmosphere and on Earth Surface; Heat Supply to Different Surfaces; Moist Air; Cloud; Fog; Precipitation; Air masses; Frontal Theory; Meteorological Instruments; Methods of Observation and Codes; Aeronautical Meteorology; Climatology; Agrometeorology; Telecommunications operation; Global Telecommunication System; Regional aspects; Aeronautical Fixed Service.

Entry: G.C.E. or O Level in maths, physics or chemistry.

BRUNEI DARUSSALAM

BRN-1	Brunei Meteorological Service - Training Unit	TEL:	(673-2) 330 142
Contact	Permanent Representative with WMO	FAX:	(673-2) 332 735
Address:	Brunei Meteorological Service Department of Civil Aviation, Brunei Inter. Airport BERAKAS 2015, Negara Brunei Darussalam	E-M/tlx:	BU 22.67 DCA BWN

BRN-1-1 Key-words: MET Observation Cl.3 ProfF-Bases 5 months Ad hoc English 1995

Course Title: *Observer Training Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The topics, based on Compendium of Lecture Notes for Training Class IV meteorological personnel, are as follows: Composition and Vertical Division of the Atmosphere; Heat Exchanges Process in the Atmosphere; Air Temperature and Pressure; Moist Air; Stability of Atmosphere; International Cloud Classification, Observation, Formation and Dispersal; Surface Wind, local Wind; Meteors, Precipitation Process; Tropical and Aviation Meteorology; Severe Local Storms; Air-Masses and Fronts; Weather Charts and Tephigram - Plotting and Analysis; The Nature of Meteorological Observation; General Aspects of Surface Instrument Observation; Measurement of Precipitation, Visibility, Evaporation, Sunshine, Humidity, Pressure, Temperature and Wind; Meteorological Codes, Logging, Coding and Transmitting of Meteorological Observations; Upper-Air: (a) Observation, Computation and Analysis using Pilot Balloon, Theodolite and Wind Finding Radar; (b) Observation, Computation and Analysis using Vaisala Radiosonde.

Up to five months for Observer Course, two months for Radiosonde.

Entry: General Certificate of Education ("O"- Level or "A"- Level).

BRN-1-2 Key-words: MET Observation Cl.3-4 ProfF-Bases 2 months Ad hoc English 1995

Course Title: *Radiosonde Training Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Relevant topics are selected from the Syllabus of Observation Course (see BRN-1-1), and adapted for the radiosonde training course, but Course's accent is placed upon the Upper-Air Observation subjects: (a) Observation, Computation and Analysis using Pilot Balloon, Theodolite and Wind Finding Radar; (b) Observation, Computation and Analysis using Vaisala Radiosonde.

Entry: General Certificate of Education ("O"- Level or "A"- Level).

CHINA, The People's Republic of

CHN--1	WMO Regional Meteorological Training Center at Nanjing	TEL:	(86-25) 779-2648
Contact	Nanjing Institute of Meteorology	FAX:	(86-25) 779-2872
Address:	Department of Computer and Information Engineering Nanjing, Jiangsu Province, 210044 The People's Republic of China	E-Mail:	6933

CHN--1--1 Key-words: MET PredictForec Cl. 1b ProfS-Advan 4 weeks Annual English 1995

Course Title: *Interpretation and Application of Numerical Weather Prediction Products*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Fundamental Principles of Numerical Weather Prediction (NWP): basic knowledge of numerical methods, primitive equations models, etc. Model Verification and Error Analysis: verification of numerical models, error correction of NWP products, etc. Processing of NWP Model Output Products: allocation of hardware and software, data bank for NWP output fields, data bank for meteorological elements. Statistical Methods for NWP Products Interpretation: simple statistical methods, discriminatory analysis. Statistical Interpretation of NWP Products: design and derivation of prediction, verification of forecast equations, ridge regression method. Dynamic Interpretation of NWP Products: model output forecasting of urban weather (DWO), one dimensional boundary layer model, etc. Synoptic Interpretation of NWP Products: NWP interpretation with synoptic models, NWP interpretation with empirical indices. Application of NWP Products in Specialized Meteorological Services: application of NWP products in meteorological navigation, aviation forecast and forest-fire warning, etc. Advances in NWP and Product Interpretation: advances in NWP product interpretation, brief introduction of meteorological expert system.

The most recent training course on Interpretation and Application of Numerical Weather Prediction Products was held in 1995, from October 9 to November 8. The aim of the course was to introduce the fundamental principles of numerical weather prediction and the operational techniques in interpretation and application of NWP products. The participants' travel expenses were provided by their own governments, or by UN organizations such as UNDP and WMO. The Chinese Government was responsible for the expenses of the participants' board and lodging during the course in China. In addition, they received pocket money.

Entry: Applicants should have a B.Sc. degree in synoptic and dynamic meteorology in addition to at least three years of practical experience in the field of operational forecasting.

CHN--1--2 Key-words: MET Scientific Cl. 1a-1c ProfE-Advan 1 year Annual Chinese,E 1995

Course Title: *Synoptic Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Basic Characteristics of Air Motion: fundamental laws of controlling air motion, relation between wind fields and pressure fields, etc. Air Masses and Fronts: air mass, characteristics of meteorological elements in the vicinity of fronts, frontogenesis and frontolysis. Cyclone and Anticyclone: features of cyclone and anticyclone and their classification, vorticity and its equation, etc. Atmospheric Circulation: basic factors of controlling atmospheric circulation and major patterns of atmospheric circulation, general situation of circulations in poles and tropics. Prediction of Weather Situation and of Weather Systems and Elements: synoptic methods for predicting weather systems and weather situations, synoptic methods for predicting weather elements and weather phenomena.

The purpose of the course is to systematically introduce fundamental theories of atmospheric dynamics and thermodynamics as well as its application in weather analysis and forecasting, through which students are able to master the features of weather systems. This course has different academic levels in response to undergraduate, postgraduate and Ph.D. The Department also provides other courses such as advances in synoptic meteorology, weather diagnosis, probability and mathematic statistics, long- and medium-range weather forecasting and statistical weather forecasting.

Entry: Excellent high school graduates or those with a B.Sc. degree who wish to study for higher degrees such as M.Sc. or Ph.D.

CHN--1--3 Key-words: MET Scientific Cl. 1a-1b ProfE-Advan 1 semester Annual Chinese,E 1995

Course Title: *Principles of Climatology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Radiation Balance; Heat Balance and Water Balance; Application of Atmospheric Circulation in Climate For

mation; Interaction Between Ocean and Air and Between Sea and Land; Effect of Topography on Climate; Action of Polar Ice in the Formation of Climate; Impact of Human Activities on Climate; Climatic Classification; The Past and Future of Climate; Brief Introduction of Climate Simulation.

The content of the course contains some principles of climate formation and evolution as well as research methods. Before studying this course, students are required to have knowledge on climatology, synoptic meteorology, dynamic meteorology and climatic statistics. Through study, the students can master the fundamental theories and improve their ability in weather diagnosis, research on climate prediction, analysis, exploitation and utilization of climate resources in the future. Furthermore, the Department of Applied Meteorology also offers many other courses such as agroclimatology, agro-microclimatology, climatic statistics, numerical modelling of climate, applied climate, etc.

Entry: Excellent high school graduates or those with a B.Sc. degree who wish to study for higher degrees.

CHN-1-4 Key-words: MET Scientific Cl. 1a-1b ProfE-Bases 1 semester Annual Chinese,E 1995

Course Title: *Agrometeorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction; Solar Radiation and Agricultural Production; Heat Condition and Agricultural Production; Water Condition and Agricultural Production; Air, Wind and Agricultural Production; Major Agrometeorological Disasters; Agrometeorological System and its Models.

This course is one of the important courses in the agrometeorological speciality, which depicts the basic theories and patterns of agrometeorological elements such as light, heat, water and air that exert extremely important influence on growth, development and product formation of plants. Through this study, students can master the basic theory and develop the ability to analyze and solve problems related to agrometeorology. In addition, this department also provides other courses such as agrometeorological statistics, agroecology, agricultural environment protection and application of PC in agrometeorology.

Entry: Excellent high school graduates or those with a B.Sc. degree who wish to study for higher degrees.

CHN-1-5 Key-words: MET Scientific Cl. 1a-1b ProfE-Bases 1 year Annual Chinese,E 1995

Course Title: *Atmospheric Physics*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Brief Introduction; Radiation; Heat Condition on Ground and in Air; Atmospheric Statics; Atmospheric Thermodynamics; Vertical Motion and Stability of Air; Horizontal Motion of Air; Physics of Cloud and Precipitation; Phenomena of Light, Electricity and Sound in the Atmosphere; Atmospheric Physics in Upper Level.

This course is designated to provide a basic professional knowledge to students who will study meteorology for bachelor, master's and doctorate degrees later on. The Department also offers many other courses such as cloud-precipitation physics, cloud-precipitation physics experiments, air pollution meteorology, atmospheric boundary-layer physics, cloud dynamics, satellite picture analysis, cloud and fog sounding, weather modification, atmospheric sounding, radar meteorology and satellite meteorology.

Entry: Excellent high school graduates or those with a B.Sc. degree who wish to study for higher degrees.

CHN-1-6 Key-words: MET PredictForec Cl. 1b ProfS-Advan 4 weeks Ad hoc English 1995

Course Title: *Radar Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Principles of Radar; Radar Detection of Spherical Particles; Radar Data Processing; Attenuation; Propagation of Electromagnetic Waves; Precipitation Measurements with Radar; Principle of Pulsed Doppler Radar; Application of Radar Data in Analysis and Forecasting of Small- Middle- and Large-scale Weather Systems; Use of Radar in Cloud Physics Research; Nowcasting and Combined Analysis of Meteorological Data from Multiple Information Sources.

The Chinese Government will be responsible for the expenses of the participants' board and lodging during the course in China. In addition, they may receive pocket money. The participants' travel expenses, however, should be provided by their own governments if they may apply for allowances from UN organizations such as UNDP and WMO.

Entry: Class I and II staff with experience in radar meteorology, weather forecasting or those whose work is related to weather radar and its data application.

CHN-1-7 Key-words: MET InstrumEquip Cl. 1a ProfE-Elect 1 semester Annual Chinese,E 1995

Course Title: *Principles of Computers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction to Computer System: structure of a computer system and its principle, the development of computer technology and computer application. Logical Components of a Computer: basic logical operation, timed logical circuits. Arithmetic Unit: the structure of the CPU and its working principle, floating point arithmetic unit. Instruction Set: instruction format, machine language and assembler language. Control Unit: hardware system and control unit, the basic principle of using microprogramme to control a computer. Memory System: memory and memory system, main memory and parallel main memory cache. Secondary Storage: magnetic recording principle, hard disk and storage, CDROM. I/O System: Input/Output devices, interruption concept and its application, DMA control method, channel control and peripheral processor.

The purpose of the course is designed so that students: (a) have command of computer hardware structure and its working principles, which are based on PC-series computers; (b) master the concepts of instruction stream, addressing methods, and assembler language; and (c) understand the process of an instruction execution; other computer hardware courses and system development.

Entry: Students should have adequate knowledge of analog and digital electronics.

CHN-1-8 Key-words: MET InstrumEquip Cl. 1a UnivE-Elect 1 semester Annual Chinese,E 1995

Course Title: *Operating System*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction: operating system's position in a computer system, the types of operating system. Job Management: job and job's organization, the interface between user and operating system. Processor Management: the concept and control of process, communication between processes, dispatching a process, deadlock. Memory Management: concepts concerned with memory management, fixed partition allocation method, pages segment memory management, virtual memory management. Devices Management: the physical and logical characters of I/O devices, I/O control system, spooling system. File Management: concepts of data file, operation on file, file sharing and file security, structure of a data management system.

This course is one of the main courses for students who major in computer applications. Through study, students should acquire command of the basic concepts, principles and methods of operating systems and understand the work flow of modern computer systems. It, therefore, can lay a foundation for students to design computer systems, application systems and modern meteorology systems.

Entry: Before studying this course, students should have adequate knowledge of computers.

CHN-1-9 Key-words: MET Scientific Cl. 1a-1c UnivE-DynaM 1 year Annual Chinese,E 1995

Course Title: *Dynamic Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Fundamental Knowledge; Basic Equations Depicting Air Motion; Scale Analysis and Simplifying Basic Equations; Circulation Theorem; Vorticity Equation and Divergence Equation; Planetary Boundary Layer of Atmosphere; Atmospheric Energetics; Wave Motion in Atmosphere; Brief Introduction to Numerical Forecasting.

This course systematically introduces the atmospheric thermodynamic processes and basic patterns of air motion on the basis of thermodynamics and fluid dynamics. Students should have studied meteorology and synoptic meteorology before starting this course. Through study, students will acquire a thorough understanding of the basic theory of atmospheric dynamics so as to apply it to solve problems in weather analysis and forecast. The course also lays a solid foundation for students majoring in software to bring into full play in weather operation and meteorological research in the future.

Entry: Excellent high school graduates or those with a B.Sc. degree who wish to study for higher degrees.

CHN-2 Beijing Department of Atmospheric Sciences

TEL: (86-01) 833-2277

Contact Beijing Meteorological Institute

FAX:

Address: 46, Baishiqiaolu Road

E-M/lx:

Beijing 100081, P.R. of China

CHN-2-1 Key-words: MET PredictForec Cl. 1b ProfS-Advan 2 weeks Annual Chinese 1995

Course Title: *Some Advanced Techniques in Numerical Weather Prediction (NWP)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

This course comprises 14 lectures which cover some advanced techniques in NWP, with the emphasis on: The Variable Resolution Grid; 4-Dimensional Assimilation; Parallel Computation; Satellite Application; Predictability; Medium-Scale Simulation; Parameterization of Physical Processes (boundary layer, radiation, moisture cycle, etc.) and Comparison of some well-known GCMs. The text used for this course is SOME ADVANCED TECHNIQUES IN NWP (LIAO Dongxian and LIU Chongjian, Eds), China Meteorological Press, Beijing, 1995.

Board and lodging arrangements are made by the students themselves. The starting date will be October and November. Further information can be obtained from the Dean's Office, Beijing Meteorological Institute.

Entry: M.Sc. degree or Title of Senior Engineer with two years or more of operational experience in meteorology.

CHN-2-2 Key-words: MET PredictForec Cl. 1 UnivE-Bases 4 years Annual Chinese 1995

Course Title: *Synoptic Dynamical Meteorology leading to a Bachelor of Science*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

OBLIGATORY SUBJECTS: Mathematics 1; Calculus; Mathematics 2; Linear Algebra; Analytic Geometry; Series and Differential Equations; Probabilities and Mathematical Statistics; Complex Functions and Mathematics Equations; Foreign Languages (English, Japanese or Russian); Physical Education; Fluid Dynamics; Dynamical Meteorology; Synoptic Meteorology; Statistical Weather Prediction; Medium-Long Term Weather Prediction; Numerical Weather Prediction; and Synoptic Analysis (practice)

ELECTIVE SUBJECTS: General Circulation of the Atmosphere; Low latitude systems; Expert systems; Medium-scale synoptic meteorology; Scientific and Technical writing technique.

The Institute offers students free accommodation and boarding facilities. Starting date of the course is within the first ten days of September and the registration deadline is the day before the starting date. Further information could be sought from the Dean's Office Beijing Meteorological Institute.

Entry: Diploma of a Senior High School with a High Mark in the Entrance Examination.

CHN-3 Chengdu Institute of Meteorology

TEL: (86-28) 555-3295

Contact: Chengdu Institute of Meteorology

FAX: (86-28) 555-2580

Address: Atmospheric Electronics Department
Chengdu, Sichuan 610041
P. R. China

E-Mail:

CHN-3-1 Key-words: MET PredictForec Cl. 1a-2 UnivE-DynaM 20 weeks Biannual Chinese,E,R 1995

Course Title: *Dynamic Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

THE SUBJECTS in the course of study are as follows: The Fundamental Equations of Fluid Mechanics and Thermodynamics necessary for understanding large-scale atmospheric motion; The Planetary Boundary Layer; Atmospheric Energetics; Linear Wave Theory, including Rossby Waves, Inertio-gravity Oscillations and Mixing Waves of the Atmosphere; The Baroclinic Instability Problem, including Hydrodynamic Instability and Eady Instability; The Geostrophic Adjustment Process; Scale Theory; Synoptic-Scale Tropical Motions; Introductions to Equatorial Wave Theory and Steady Forced Equatorial Motions.

Student lodging and boarding are available. Registration deadline: August 30 for the autumn semester; (February 25 for the spring semester). Starting date of the course: September 1 for the autumn semester (March 1 for the spring semester). It may be mentioned that Dynamic Meteorology is a major subject for university degree. Vocational perspectives: scientific researcher, pursuing higher degrees and doing operational forecasts.

Entry: Previously acquired knowledge: fluid mechanics, thermodynamics, higher maths.

CHN-3-2 Key-words: MET Operational Cl. 1a-2 UnivE-Elect 20 weeks Biannual Chinese,E 1995

Course Title: *Meteorological radar principle and system*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The course is one of the major subjects of Atmospheric Sounding speciality. Mainly, it includes: Meteorological Radar Principles; Radar Equation; Radar System, component equipment; Radar Measurement Methods; Radar Echo Identification and Estimation; Data Processing of Radar Terminator. Introduction of equipment mainly includes 711, 713, and Doppler type of meteorological radar.

Student lodging and boarding are available. Registration deadline: August 30 for the autumn semester;

(February 25 for the spring semester). Starting date of the course: September 1 for the autumn semester (March 1 for the spring semester). Vocational perspectives: the knowledge of meteorological radar principle and equipment, in addition to computer operation and programming, can make good use of data obtained from meteorological radar and satellite observation and enhance data processing and analysing ability.

Entry: Students with acquired knowledge of the second grade of engineering college, and finished electronic engineering speciality basic subjects (including electromagnetic field and wave, digital signal processing, and random signal processing, etc.).

CHN-3-3 Key-words: MET InstrumEquip Cl.1a-1b UnivE-SateM 1 month Biannual Chinese,E 1995

Course Title: *Satellite Communication and VSAT*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The core course of undergraduate study and continuing engineering education study for Communications Engineering Speciality: Basic Concept and Technique of the Digital Satellite Communication System; TES (Telephony Earth Station) Network System; The Composition and Principles of ISBN System; Remote Terminal Equipment of the TES & PES; Installation, Commission, Usage and Maintenance of the Remote Terminals of TES & PES.

Student lodging and boarding are available. Registration deadline: August 30 for the autumn semester; (February 25 for the spring semester). Vocational perspectives: after completion of the course, the trainee can be engaged in the installation, usage, maintenance, fault diagnosis and development of application software for VSAT systems.

Entry: Senior student or graduate from colleges; Communication/Computer Speciality. Previous courses: Principles and Applications of Microcomputers; DOS Operating System; Communication.

CHN-3-4 Key-words: MET Operational Cl.2-4 ProfS-Elect 20 weeks Biannual Chinese,E 1995

Course Title: *Identification and repair of meteorological instrument*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The course mainly includes: Identification and Repair of Common Meteorological Observation Instruments; Construction and Principle of Meteorological Instruments; Principles of Measurement Identification Equipment and Identification Regulation.

Student lodging and boarding are available. Registration deadline: August 30 for the autumn semester ; (February 25 for the spring semester). Starting data of the course: September 1 for the autumn semester (March 1 for the spring semester). Vocational perspective: the course is a major subject of meteorological instrument measurement identification speciality. After trained in the speciality, people can master measurement principles and techniques of various meteorological parameters, acquire micro-computer software, hardware and interface knowledge, skilfully, apply identification instrument for the purpose of examining and testing common and modern meteorology instruments.

Entry: The course is for students who have mastered the knowledge of the second grade of college for professional training, learned basic electronic engineering subjects and have experience in atmospheric sounding practice and passed error theory course.

CHN-4 Lanzhou University

TEL: (86-0931) 884-3000

Contact Department of Atmospheric Science

FAX: (86-0931) 888-5076

Address: Lanzhou University
LANZHOU 730000, P. R. China

E-M/tx: qiuoj@lzu.edu.cn

CHN-4-1 Key-words: MET Scientific Cl.1c UnivE-Bases 15 weeks Biannual English 1995

Course Title: *Mesoscale Meteorological Modeling*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Basic Equations of Mesoscale Models; Hydrostatic and Nonhydrostatic Models; Numerical Methods used in Mesoscale Models; Planetary Boundary Layer Parameterization; Moist Processes and Parameterization; Data Assimilation; Predictability of Mesoscale Motions; Typical Mesoscale Models.

Registration deadline: 15 June. Starting date: 15 September. Computers, E-mail and Facsimile available.

Entry: Graduate from the University Department of Meteorology.

CHN-5	Hohai University	TEL: (86-25) 332-3777
Contact	Department of Water Resources and Hydrology	FAX: (86-25) 331-5375
Address:	Hohai University 1, Xikang Road 210098, Nanjing, P.R. China	E-M/tlx:

CHN-5-1 Key-words: HYD Scientific Cl. 1b UnivF-Bases Flexible Ad hoc English 1995

Course Title: *Advanced Postgraduate Hydrologic Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Watershed Hydrology and Modeling; Uncertainties in Water Science; Water Issues for Developing Countries; Water Issues Related to Environment; Water Issues Related to Disaster Prevention and Mitigation; Water Issues Related to Social and Economic Development; Application of New Techniques in Hydrology and Water Resources Management.

Hotel (single room, double room) is available on the campus. Airport and train station are nearby with convenient connections from Beijing, Shanghai or Hong Kong to Nanjing. The course is not held every year, depending on UNESCO or WMO. The aim of the course is the renewal of knowledge concerning the development of water science. Emphasis lies on application. Vocational perspective is good for the trainee. Sponsorship is possible. Expenditure mainly depends upon financial aid of relevant international organizations (in this case, tuition is free). Further information can be requested directly from the Department of International Cooperation of Hohai University.

Entry: Postgraduate.

CHN-6	Shenyang Agricultural University	TEL: (86-24) 841-4218
Contact	Depart. of Agronomy, Agricultural Meteorology Division	FAX: (86-24) 841-7416
Address:	Shenyang Agricultural University Shenyang, Liaoning Province P. R. of China, 110161	E-M/tlx: 4426

CHN-6-1 Key-words: MET Scientific Cl. 1a UnivE-Agric 4 years Annual Chinese 1995

Course Title: *Agricultural Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General Meteorology; Synoptic Meteorology; Climatology; Climatological Statistics; Meteorological Observation and Instrumentation; Agricultural Meteorology; Agricultural Climatology; Microclimatology; Agrometeorological Information and Forecast; Agrometeorological Observation and Experimental Method; Forest Meteorology; Satellite Meteorology.

Entry: The national undergraduate or graduate student entrance test is required.

CROATIA, The Republic of

HRV-1 University of Zagreb

TEL: (385-41) 275 005

Contact Permanent Representative with WMO

FAX: (385-41) 278 703

Address: Meteorological and Hydrological Service

Gric3, 41000 ZAGREB, Croatia.

E-Mail: vucetic@cirrus.dhz.hr

CC: Univ. of Zagreb, Fac. of Sciences; Gephys Instit.

HRV-1-1 Key-words: MET Operational Cl. 1a-1c UnivF-ET&R 2-4 years Annual Croatian 1988

Course Title: *Training for: (a) B.Sc., professional meteorologist; (b) M.Sc. in physics-meteorology; (c) Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Mathematics and physics in the first two years; meteorology and introduction to geophysics, in the next two years;

GRADUATE COURSES (M.Sc., Ph.D.) New methods of weather analysis, forecasting and meteorological statistics. M.Sc./Ph.D. thesis.

Duration: (a) four years. (b) two years. (c) three years. Language: Croatian. Knowledge of foreign language (English, German, Russian or French).

Entry: (a) Secondary school certificate. (b)/(c) B.Sc. degree / recommendation of two university professors.

CZECH REPUBLIC, The

CZE-1 Czech Hydrometeorological Institute

Contact Permanent Representative with WMO
Address: Czech Hydrometeorological Institute
Na Šabatce 17
143 06 PRAHA 4, Czech Republic

TEL: (42-2) 401-6503
FAX: (42-2) 401-0800
E-M/tx: 12.33.35 CHMUC

CZE-1-1 Key-words: MET Operational Cl.1b ProfS-SateM 9 months Ad hoc English 1995

Course Title: *Satellite Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

History of Satellite Meteorology; Contemporary Satellite Systems; Satellite On-Board Systems; Principles of Remote Sensing; Spectral Characteristics; Scanning Systems; Sensor Properties; Scanning Principles, Technology and Equipment; Communication Principles: Information Transport, Coding and Demodulation; Electromagnetic Wave Propagation; Reception Antennas; Recording and Storage; Satellite Data Primary Processing; Geometrical Correction; Radiometrical Enhancement; Navigation; Thermal Calibration; Graphic Overlays; Simple Applications: Satellite Rainfall Monitoring Methods, Hydrology, Air Pollution, Nowcasting, Aviation Meteorology; Computer Processing: Basic Features of Computers, Programming Techniques and Languages, Satellite Image Data Processing, Digital Image Classification; Satellite Indirect Sounding of the Atmosphere; TOVS Data and their Processing; Practical Training; Meteosat Data Processing; TROS-N Data Reception and Primary Processing; Imagery Classification.

The optimal number of students is 6-10 and the course is organized approximately 6-9 months after the necessary number of students is selected.

Entry: University degree with a physics background.

CZE-2 Agricultural University Prague, Suchbátol

Contact Postgraduate Training Courses in Hydrology
Address: Department of Water Resources
Faculty of Forestry, University of Agriculture
165 21 PRAGUE 6 - Suchbátol, Czech Republic

TEL: (42-2) 338 2147
FAX: (42-2) 338-2000
E-M/tx: MICHALKO@LES.VSZ.CZ

CZE-2-1 Key-words: HYD Clhymet Cl.1b UnivS-Water 3 months Biennial English 1995

Course Title: *Hydrological Data for Water Resources Planning*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Statistics; Stochastic Processes; Use of Personal Computers; Hydrogeology; Engineering Hydrology; Sub-surface Flow; Water Resources Development Planning; Water Chemistry and Water Quality; Regional Hydrology; Impact of Global Climate Changes on Water Resources; Hydrological Models; Hydrological Forecasting; Reservoir Operation; Environmental Engineering; Hydroinformatics; Data Collection and Processing; Experimental and Representative Basins; Use of Tracers in Hydrology; Meteorology; Practical Training in Laboratories and in the Field. Study Tour.

Enrolment fee is USD 300.- A limited number of fellowships may be granted by the Czech Government. The accommodation is possible in the University campus. The expenditures for accommodation and food on campus are a minimum of USD 300.- per month

Entry: University degree or equivalent in hydrology or in a related field. Two-year practice in hydrology or water resources

DNK-1 University of Copenhagen, Department of Geophysics,

Contact: University of Copenhagen
Address: Department of Geophysics
Rockefeller Complex, Juliane Maries Vej 30
DK-2100, COPENHAGEN, Denmark

TEL: (+45) 3532-0601
FAX: (+45) 3536-5357
E-Mail:

DNK-1-1 Key-words: MET Scientific Cl. 1a-1b UnivE-DynaM Flexible Ad hoc Danish 1997

Course Title: *Courses in meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General courses in Dynamical Meteorology up to advanced level.

Entry: Equivalent to entry for B.Sc. mathematics/physics.

DNK-2 Danish Meteorological Institute

Contact: Danish Meteorological Institute
Address: Lyngbyvej 100
DK-2100 COPENHAGEN, Denmark

TEL: (+45) 3915-7500
FAX: (+45) 3927-1080
E-Mail: dmi@DMI.dk

DNK-2-1 Key-words: MET PredicForec Cl. 1 ProfF-Bases 9 months Ad hoc Danish 1997

Course Title: *Operational Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Mainly WMO Syllabus for Class I and Class II meteorological personnel training, including Special courses in: Synoptic and Dynamic Meteorology; Maritime and Aeronautical Meteorology; Satellite and Radar Meteorology; Climatology; Environment and Pollution. Further more courses in: Weather Observation; Computer Automation and Media-communication

Students employed by DMI.

Entry: B.Sc. (meteorology).

DNK-2-2 Key-words: MET Observation Cl. 3-4 ProfF-Bases 5 weeks Ad hoc Danish 1997

Course Title: *Training in Weather Observation*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Mainly WMO-Syllabi for Class IV meteorological personnel training engaged in Aeronautical Meteorology. The aim of the course is to give, to practice and to exercise the necessary satisfactory theoretical and practical knowledge to enable the student to discharge imposed assignments. The course includes: General Aeronautical Meteorology; Meteorological Instruments; Meteorological Observations, including to code and de-code observations.

Generally, only personnel employed by DMI and Airport Authorities are accepted. The course is terminated with a final examination. Due to regulations, former adequate on-the-job training is necessary prior to operational duty.

Entry: Ten years primary and secondary school education including English language.

EGYPT, The Arab Republic of

EGY-1	Regional Meteorological Training Centre, Cairo	TEL: (20-2) 830 105					
Contact	The chairman, Board of Directors	FAX: (20-2) 284-9857					
Address:	The Egyptian Meteorological Authority P.O.Box 11784, CAIRO, Egypt	E-M/tlx: 94293 METEG UN					
	CC: Regional Meteorological Training Centre						
EGY-1-1	Key-words: MET PredictForec Cl. 1b ProfS-Advan 10 months Annual English 1995						
Course Title:	<i>Professional Forecaster</i>						
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):	Advanced Dynamic Meteorology; Advanced Physical Meteorology; Synoptic Meteorology; Meteorological Codes and Transmissions; Aeronautical Meteorology; Statistical Forecasting; Laboratory Exercises.						
	The attendance of this course should follow, as far as possible, immediately after completion of diploma in meteorology. Course starts in November every year; class capacity 24 students. Fees \$ 500 per month.						
Entry:	B.Sc. in physics and/or mathematics followed by Diploma in meteorology.						
EGY-1-2	Key-words: ENV Operational Cl. 1b ProfS-Clima 6 months Ad hoc English 1995						
Course Title:	<i>Climatologist</i>						
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):	General Climatology; Physical Climatology; Dynamic Climatology; Synoptic Climatology; Upper-air Climatology; Regional Climatology; Climate Change and Variability; Climate Methods and Statistics; Data-processing Methods; Special Topics.						
	Class capacity 10 students; organized on request. Fees: \$ 500 per month.						
Entry:	Experience of at least one year as successful professional forecaster; class I meteorological personnel.						
EGY-1-3	Key-words: MET PredictForec Cl. 1b ProfS-NWP 6 months Ad hoc English 1995						
Course Title:	<i>Numerical Weather Prediction</i>						
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):	Basic Dynamic Meteorology; Numerical Methods; Forecasting Models; Physical Processes; Objective Analysis Initialization (data assimilation); Laboratory Exercises.						
	Course organized on request; class capacity 10 students. Fees: \$ 500 per month.						
Entry:	Experience of at least two years as successful professional forecaster.						
EGY-1-4	Key-words: MET Operational Cl. 1b ProfS-Agric 6 months Ad hoc English 1995						
Course Title:	<i>Agrometeorologist</i>						
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):	Introduction; Agricultural Meteorology; Agricultural Science; Agrometeorological Observation; Instruments; Stations Network and Data Processing; Weather and Climate related to plants, animals, crops, insects, plant pests and diseases; Laboratory and Field Exercises.						
	Course organized on request; class capacity 10 students. Fees \$ 500 per month.						
Entry:	Experience of at least one year as a successful professional forecaster.						
EGY-1-5	Key-words: MET InstrumEquip Cl. 1b ProfF-Instr 6 months Ad hoc English 1995						
Course Title:	<i>Instruments Specialist</i>						
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):	Introduction; Technical Practices; Workshop Technology; Electronics; Mechanical and Electromechanical Meteorological Instruments; Electronic Meteorological Instruments.						
	Course organized on request; class capacity 5 students. Fees \$ 500 per month.						
Entry:	Diploma in Meteorology, experience in forecasting is an advantage.						
EGY-1-6	Key-words: MET Operational Cl. 1b ProfF-Abini 9 weeks Ad hoc English 1988						
Course Title:	<i>Introduction to Meteorology</i>						

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):
 Introduction; General Meteorology; Meteorological Elements, Observations and Instruments; Synoptic Meteorology; Climatology; Application of Meteorology; Testing and Calibration Practices; Laboratory and Field Exercises.
 Fees: \$ 600 in 1988.
 Entry: Mainly university degree.

EGY-1-7 Key-words: MET Clhymet Cl. 1b ProfS-Agric 6 months Ad hoc English 1988

Course Title: *Agricultural scientists*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction; Meteorological Elements with relation to Agriculture Meteorology; Climatology; Radiation in the Atmosphere; Ecology of crops, animals and insects; Agroclimatic Stations; Crop Forecasts; Satellite Application in Agrometeorology; Special Weather Forecasts for Agriculture; Practical Work on Meteorological Instruments; Methods of Observation; Practical Work based on the Theoretical Course.

Fees: \$ 1200 in 1988.

Entry: University degree in agricultural science. Course EGY-1-6.

EGY-1-8 Key-words: MET Observation Cl. 4 ProfF-Bases 8 months Ad hoc Arabic,E 1995

Course Title: *Basic course for observers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction; General Meteorology; Meteorological Instruments and Methods of Observations; Climatology; Meteorological Codes; Disciplinary Practices.

Course starts in September, every year; class capacity 60 students. Fees \$ 500 per month.

Entry: Secondary school certificate (science or mathematics) or electronic technical certificate.

EGY-1-9 Key-words: MET Observation Cl. 4 ProfF-Aeron 4 months Annual Arabic,E 1988

Course Title: *Surface observer*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction; Aeronautical Meteorology; Laboratory and Field Exercises.

The attendance of this course should follow, as far as possible, immediately after completion of Course EGY-1-8. This course can be given in Arabic for those students who do not know English well. Fees: \$800 in 1988.

Entry: Satisfactory completion of Course EGY-1-8.

EGY-1-10 Key-words: ENV Clhymet Cl. 4 ProfF-Agric 4 months Ad hoc Arabic,E 1988

Course Title: *Agricultural and Environmental Observer*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction; Services of Agrometeorology; Environmental Instruments and Observations; Methods of Observation; Laboratory Field Exercises.

The attendance of this course should follow, as far as possible, immediately after completion of course EGY-1-8. This course can be given in Arabic for those students who do not know English well. Fees: \$1200 in 1988.

Entry: Satisfactory completion of Course EGY-1-8.

EGY-1-11 Key-words: MET Observation Cl. 4 ProfF-Aerol 6 months Ad hoc Arabic,E 1988

Course Title: *Upper Air Observer*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Electricity and Radio; Meteorological Instruments for Upper-air Observation; Methods of Observation; Laboratory and Field Exercises.

The attendance of this course should follow, as far as possible, immediately after completion of course EGY-1-8. This course can be given in Arabic for those students who do not know English well. Fees: \$1200 in 1988.

Entry: Satisfactory completion of Course EGY-1-8.

EGY-1-12 Key-words: MET Technician Cl.3 ProfS-Synop 6 months Annual English 1995

Course Title: *Synoptic Technical Assistant*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction; Additional Meteorological knowledge; Climatological Statistics; Graphical and Synoptic Representation; Meteorological Codes; Aeronautical Meteorological Knowledge; Laboratory Exercises.

Course starts in January, every year; class capacity 10 students. Fees \$ 500 per month.

Entry: Adequate experience as surface observer or upper air observer.

EGY-1-13 Key-words: ENV Technician Cl.3 ProfS-Clima 6 months Ad hoc English 1995

Course Title: *Climatology Technical Assistant*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction; Physical Climatology; Synoptic Climatology; Regional Climatology; Climatic Methods and Statistics; Data Processing Methods; Laboratory Exercises.

Course starts in January, every year; class capacity 10 students. Fees \$ 500 per month.

Entry: Adequate experience as surface, upper-air or agrometeorological observer after satisfactory completion of course EGY-1-9 or EGY-1-11.

EGY-1-14 Key-words: MET Technician Cl.3 ProfF-Agric 6 months Ad hoc English 1988

Course Title: *Agrometeorology Technical Assistance*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction; Agrometeorological Instruments; Micrometeorology; Soil Temperature; Soil Moisture; Weather Hazards Adversely Affecting Agricultural Output; Processing of Agrometeorological Data; Practical Applications; Practical Training.

Fees: \$ 1200 in 1988.

Entry: Adequate experience after satisfactory completion of course EGY-1-10.

EGY-1-15 Key-words: MET InstrumEquip Cl.3 ProfF-Instr 6 months Annual English 1995

Course Title: *Electronics Technician*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction; Electronics; Workshop Technology; Engineering; Meteorological Instruments; Testing and Calibration Practices; Laboratory and Field Exercises.

Course starts in September, every year; class capacity 10 students. Fees \$ 500 per month.

Entry: Adequate experience as upper air observer. Adequate experience as laboratory assistant.

EGY-1-16 Key-words: MET InstrumEquip Cl.3 ProfF-Instr 6 months Ad hoc English 1988

Course Title: *Mechanics Technician*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction; Workshop Technology; Engineering Drawings; Meteorological Instruments; Laboratory and Field Exercises.

Fees: \$ 1200 in 1988.

Entry: Adequate experience as surface observer. Adequate experience as laboratory assistant.

EGY-2 **Cairo University**

TEL: (20-2) 830 105

Contact The chairman, Board of Directors

FAX: (20-2) 284-9857

Address: The Egyptian Meteorological Authority

E-M/tlx: 94293 METEG UN

P.O.Box 11784, CAIRO, Egypt

CC: Cairo University, Faculty of Science

EGY-2-1 Key-words: MET Operational Cl.1a UnivF-AbIni 12 months Annual English 1988

Course Title: *Diploma in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Physical Meteorology; Dynamic Meteorology; Synoptic Meteorology; Statistics; Climatology; Networks of

Stations; Meteorological Instruments; Laboratory Exercises.

The practical part of this course is given at the Meteorological Authority.

Entry: B.Sc. in physics and/or mathematics.

ERITREA

ERI-1	Civil Aviation Authority, Asmara	TEL:	(291-1) 181 822
Contact	Civil Aviation Authority	FAX:	(291-1) 181 255
Address:	Training Division	E-M/tlx:	
	P.O. Box 252		
	ASMARA, Eritrea		

ERI-1-1 Key-words: MET AssistForec Cl.3 Proff-Bases 9 months Ad hoc English 1995

Course Title: *Training of the Class III meteorological personnel*
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):
Standard WMO Syllabus for Class III; publication WMO-No. 258. The training Programme consists of two Parts:
PART 1, six months' class training and PART 2, three months' on-the-job training.
Entry: Class IV Training Course is essential and candidates are selected by competitive examination.

ERI-1-2 Key-words: MET Observation Cl.4 Proff-Ablni 9 months Ad hoc English 1995

Course Title: *Training of the Class IV meteorological personnel*
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):
Standard WMO Syllabus for Class IV; publication WMO-No. 258. The training Programme consists of two Parts:
PART 1, six months' class training and PART 2, three months' on-the-job training.
The Training Programme consists of two parts: 6 months class training and 3 months on-the-job training
Entry: High School Completion. Candidates are selected by competitive examination.

ETHIOPIA

ETH--1 **National Meteorological Services Agency, Addis Ababa** TEL: (251-1) 51-2299
Contact National Meteorological Services Agency FAX: (251-1) 51-7066
Address: P.O. Box 1090 E-M/tlx: 21474 TMET ET
 ADDIS ABABA, Ethiopia

ETH--1--1 Key-words: MET Observation Cl.3 ProfF-Bases 12 months Ad hoc English 1995

Course Title: *Training of Assistant Meteorologist, WMO Class III level*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Entry: WMO Class IV Diploma with at least two years of experience as observer in a National Meteorological Service and successful completion of the first year of University or College.

ETH--1--2 Key-words: MET Observation Cl.4 ProfF-Bases 12 months Ad hoc English 1995

Course Title: *Training of Meteorological Observer, WMO Class IV level*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Entry: At least a grade of "c" in Physics, Mathematics and English in the Ethiopian school Leaving Examination result, or equivalent; an entrance examination will be given.

FJI-1	Fiji Meteorological Service, Nadi Airport		
Contact	FIJI Meteorological Service	TEL:	(679) 724 888
Address:	Training Section	FAX:	(679) 720 430
	Private Mail Bag NAP 0351	E-Mail:	training@met.gov.fj
	NADI Airport, FIJI		

FJI-1-1 Key-words: MET Observation Cl.4 ProfF-Synop 8 weeks Ad hoc English 1998

Course Title: *Introductory Course in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees. etc.):

Function and Purpose of Local Meteorological Office; Meteorological Communication Procedures; Instrument Care and Routine Maintenance; Visual and Instrumental Observations; Coding of Surface and Upper-air Information; Plotting of Surface and Upper-air Data on Various Charts; Brewing and Safe Use of Hydrogen; Pilot Balloon Observation and Computation; Theoretical (Elementary) Meteorology, namely: atmosphere, atmospheric pressure, altimetry; temperature, atmospheric humidity, air density, atmospheric stability, vertical motion of air, wind, clouds, precipitation, visibility, thunderstorms, aircraft icing, air mass and fronts, pressure systems and associated weather, tropical meteorology.

Accommodation and meals: students have to make their own arrangements (with some support from the Service) for accommodation, meals and other personal expenses. Tuition and other fees: free; students have to pay for their own return air fares. Starting date: according to the requirements of the Service; notified as and when such course is arranged. Number of admissions: limited to 10-12 participants per course. Further information: only students of a neighbouring Pacific Island are accepted; recommended that arrangements be made to obtain fellowship, scholarship or sponsorship, for further information, contact the Director of FIJI Meteorological Service.

Entry: Five years of Secondary School Education in Mathematics, Physics and English.

GMB-1 Water Resources Training School, Banjul

Contact: Water Resources Training School
Address: Department of Water Resources
7 Marina Parade
BANJUL, The Gambia

TEL: (220) 228-216

FAX: (220) 225-009

E-Mail:

GMB-1-1 Key-words: MoH Observation Cl.4 ProfF-Hymet 10 months Annual English 1997Course Title: *Class IV Hydrometeorological Technician*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation fees. etc.):

OBJECTIVE OF THE COURSE: to present a multidisciplinary approach in the measurement of meteorological and hydrological elements in considerations of the inter-relationship to the multipurpose activities of the national Service.

METEOROLOGY: elementary theoretical meteorology; practical observations techniques including: coding and decoding procedures of meteorological elements, plotting of weather charts; surface and upper-air pilot balloon observations; collections and dissemination of observations; basic maintenance of meteorological instruments; preparations of climatological returns; uses of various types of meteorological reports.

HYDROLOGY: introductory principles of hydrology; principles of discharge measurements; serving of water level recorders; studies of water samples; gauging reading; processing of charts from tidal and non-tidal streams/rivers; sediment studies; hydrotechnical practices; leveling and compass surveys; introduction to ground water hydrology.

Practical Training at the nearby central forecast office and site trip to a closely located drainage basin are vital components to this course. The school caters for local requirements, however, a limited number of foreign students could be accepted. At present, no fees are charged and no accommodation is provided. A total of 15 students could be accepted annually.

Entry: Secondary School Graduates (i.e. 10 years of schooling) with good preparation in maths/physics; excellent knowledge of English.

GERMANY, The Federal Republic of

DEU-1	Meteorological Training School of the German Meteorological Service	TEL:	(+06103) 707 400
Contact	Deutscher Wetterdienst- Wetterdienstschule-	FAX:	(+06103) 707 403
Address:	Meteorological Training School Paul-Ehrlich-Straße 39 D - 63225 LANGEN, Germany	E-Mail:	412 851 DW WDSO

DEU-1-1 Key-words: MET Operational Cl. 1b-3 ProfF-Natnl Flexible Biannual German 1995

Course Title: *Education and training for DWD staff - within framework of a preparatory course for civil servants*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

CLASS 1: Courses and on-the-job training in Synoptic Meteorology, including Advanced Analysis and Forecasting. Courses in: Numerical Weather Prediction; Agricultural Meteorology; Aeronautical and Marine Meteorology; Climatology and Applied Meteorology; Biometeorology; Meteorological Instruments; Administration. On-the-job training in Aeronautical Meteorology.

CLASS 2: Courses in: Mathematics and Physics; General and Synoptic Meteorology; Weather Observation, Analysis, and Forecasting; Agricultural Meteorology; Aeronautical and Marine Meteorology; Climatology; Meteorological Instruments; Telecommunications; Administration and Organization of the Weather Service; On-the-job training in: Weather Analysis and Forecasting; Meteorological Instruments.

CLASS 3: Courses and on-the-job training in: Observation; Codes; Telecommunications; Elementary, General, and Aeronautical Meteorology; Elementary Climatology; Maintenance, Repair, and Calibration of Instruments; Organization and Administration of a Meteorological Service.

Qualifications and/or requirements for admission: Class 1: university degree (diploma and/or Ph.D.) with Meteorology being the main subject. Class 2: qualification for admission to a technical college (Fachhochschule). Class 3/4: School-leaving Certificate of a secondary school or successful attendance at the upper classes of elementary or intermediate school, and relevant professional training. The number of students depends on needs of the government. Candidates must be eligible for government service (civil servants). The candidates selected for training are paid a salary while on course. Only after successful completion of a final examination may the graduates start a professional career at the Deutscher Wetterdienst or at the Geophysikalischer Beratungsdienst der Bundeswehr (German Military Geophysical Service). Students from other countries are not accepted.

Entry: As stated under the additional information item.

DEU-2	Technical High School Darmstadt	TEL:	(+06151) 162 170
Contact	Institut für Meteorologie	FAX:	
Address:	der Technischen Hochschule Darmstadt Hochschulstrasse 1 D - 64289 DARMSTADT, Germany	E-Mail:	

DEU-2-1 Key-words: MET Scientific Cl. 1a-1c UnivF-Bases 4-5 years Biannual German 1995

Course Title: *Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Lectures, exercises and seminars in: Advanced Mathematics; Experimental and Theoretical Physics; General Meteorology; Theoretical Meteorology; Synoptic Meteorology; Climatology; Meteorological Instruments; Special Fields of Meteorology and Climatology.

"Qualifications": ABITUR (after 13 years of attendance at school) or equivalent school leaving certificate or examination to determine the eligibility for admission to studies at universities in the Federal Republic of Germany. Foreign students are accepted but have to take a test for knowledge of German language. More information can be obtained from the institute, the German Academic Exchange Service (DAAD) in Bonn or the diplomatic missions of the Federal Republic of Germany. Most students have to find private accommodation. For detailed information, including on the Syllabus, see the university calendar ("Vorleistungsverzeichnis" of the corresponding university).

Entry: As stated under "Qualifications".

DEU-3	Technical University of Braunschweig	TEL: (+531) 3950
Contact	Leichtweiss-Institut für Wasserbau	FAX: (+531) 391-4584
Address:	der Technischen-Universität Braunschweig	E-M/tlx: U.MANIAC@tu-bs.de
	Beethovenstrasse 51 A, D - 38106 BRAUNSCHWEIG, Germany	

DEU-3-1 Key-words: HYD Clhymet Cl. 1b ProfS-Water 6 months Ad hoc German 1995

Course Title: *Hydrology Part I*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Applied Hydrology; Hydrological Components and their Numerical Estimation; Measurements; Methods of Hydrological Analysis and Forecasting.

Level : open to students with academic and non-academic education. Distant learning/correspondence courses (only one week presence every six months), participants obtain a Certificate after successful examination/test; Course "Hydrology I" is part of several courses in hydrological matters (each of them one semester = six months), organized by the University of Hanover (Weiterbildendes Studium Hydrology-Wasserwirtschaft).

Entry: Diploma in civil engineering or other equivalent disciplines or equivalent experience.

DEU-3-2 Key-words: ENV Clhymet Cl. 1b ProfS-Water 12 months Annual German 1995

Course Title: *Environmental Engineering - Water Pollution Control*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Legal aspects; Hydrochemistry; Hydrobiology; Transport Phenomena in Water; Principles of Sewage Water Treatment; Point and Non-point Pollution; Water Quality Modelling of Surface and Sub-surface Flow.

See Additional Information provided under course DEU-3-1

Entry: Diploma in Civil Engineering or other equivalent disciplines or equivalent experience.

DEU-4	University of Hannover, in cooperation with DWWKe.V	TEL: (+0228) 631 446
Contact	Deutscher Verband für Wasserwirtschaft	FAX:
Address:	und Kulturbau e.V. (DWWKe.V)	E-M/tlx:
	Glückstrasse 2 D - 53115 BONN, Germany	

DEU-4-1 Key-words: HYD Clhymet Cl. 1a-1c UnivF-Water 3 years Ad hoc German 1995

Course Title: *Hydrology - Water engineering postgraduate course and other hydrological courses*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Lectures, exercises and seminars in Hydrology and Water Engineering; Hydraulics; Modelling; Water and Environment.

Level, duration: Cat 1., Hydrology - Water engineering three years; other courses 3 - 5 days. Frequency: irregular. Hydrology - Water engineering course biannually. Application is necessary. Most students have to find private accommodation. For detailed information see the university calendar ("Vorleistungsverzeichnis") of the Universität Hannover.

Entry: Diploma in civil engineering or other equivalent discipline.

DEU-5	Free University of Berlin	TEL: (49-30) 8387-1172
Contact	Institut für Meteorologie, Freie Univ. Berlin	FAX: (49-30) 8387-1128
Address:	WE 03 - Fachbereich Geowissenschaften	E-M/tlx: ifm.@bibo.met.fu-berlin.de
	Carl-Heinrich-Becker-Weg 6-10 D - 12165 BERLIN, Germany	

DEU-5-1 Key-words: MET Scientific Cl. 1a-1c UnivF-ET&R 4-5 years Biannual German 1995

Course Title: *Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Lectures, exercises and seminars in: Advanced Mathematics; Experimental and Theoretical Physics; General Meteorology; Theoretical Meteorology; Synoptic Meteorology; Climatology; Meteorological

Instruments; Special Fields of Meteorology and Climatology.

For detailed information see the university calendar ("Vorleistungsverzeichnis" of the university), and the calendar ("Kommentiertes Vorleistungsverzeichnis") of the institute giving detailed description of the lecture.

Entry: See "Qualifications" under course DEU-2-1.

DEU-6	University of Bonn	TEL:	(+0228) 735 190
Contact	Meteorologisches Institut	FAX:	(+0228) 735 188
Address:	der Universität Bonn	E-M/tlx:	rosen@ibm.rhrz.uni-bonn.de
	Auf dem Hugel 20		
	D - 53121 BONN, Germany		

DEU-6-1 Key-words: MET Scientific Cl. 1a-1c UnivF-ET&R 4-5 years Biannual German 1995

Course Title: *Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Lectures, exercises and seminars in: Advanced Mathematics; Experimental and Theoretical Physics; General Meteorology; Theoretical Meteorology; Synoptic Meteorology; Climatology; Meteorological Instruments; Special Fields of Meteorology and Climatology.

For detailed information see the university calendar ("Vorleistungsverzeichnis" of the university).

Entry: See "Qualifications" under course DEU-2-1.

DEU-7	Ruhr-Universität Bochum	TEL:	(+0234) 700-4693
Contact	Ruhr-Universität Bochum; Institute for Hydrology, Water	FAX:	(+0234) 709-4153
Address:	Management & Environmental Engineering	E-M/tlx:	schultz@hydrology.ruhr-uni-bochum.de
	Universitätsstr. 150		
	D - 44780 BOCHUM, Germany		

DEU-7-1 Key-words: HYD Scientific Cl. 1a UnivE-Water 2 semesters Annual German 1995

Course Title: *Hydrology and Water Resources*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

HYDROLOGY: Observation and Computation Techniques for all Elements of the Hydrological Cycle; Development and Application of Hydrological Models under utilization of Geographic Information Systems and Remote Sensing; Stochastic Hydrology.

WATER MANAGEMENT: Optimization and Simulation of Water Management Systems; Ecological and Socio-Economic aspects of Water Management.

Courses start in winter semester.

Entry: Civil Engineering degree.

DEU-8	University of Frankfurt	TEL:	(49-69) 7982-2321
Contact	Institut für Meteorologie und Geophysik	FAX:	(49-69) 7982-8331
Address:	der J. W. Goethe-Universität Frankfurt	E-M/tlx:	u.schmidt@meteor.uni-frankfurt.de
	Postfach 111932		
	D - 60054 FRANKFURT am MAIN, Germany		

DEU-8-1 Key-words: GEO Scientific Cl. 1a-1c UnivF-ET&R 4-5 years Biannual German 1995

Course Title: *Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Lectures, exercises and seminars in: Advanced Mathematics; Experimental and Theoretical Physics; General Meteorology; Theoretical Meteorology; Synoptic Meteorology; Climatology; Meteorological Instruments; Statistics; Atmospheric Chemistry; Special Fields of Meteorology and Climatology.

For detailed information see the university calendar ("Vorleistungsverzeichnis" of the university).

Entry: See "Qualifications" under course DEU-2-1.

DEU-9	University of Hamburg	TEL: (+040) 4123-5078
Contact	Meteorologisches Institut	FAX: (+040) 4123-5066
Address:	der Universität Hamburg Bundesstrasse 55 D - 20146 HAMBURG, Germany	E-M/tx: 214 732 unihh d
DEU-9-1	Key-words: MET Scientific Cl. 1a-1c UnivF-ET&R 4-5 years Annual German 1995	
Course Title: <i>Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.</i>		
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):		
Lectures, exercises and seminars in: Advanced Mathematics; Experimental and Theoretical Physics; General Meteorology: Theoretical Meteorology; Synoptic Meteorology; Climatology; Meteorological Instruments; Special Fields of Meteorology and Climatology.		
For detailed information see the university calendar ("Vorleistungsverzeichnis" of the university).		
Entry: See "Qualifications" under course DEU-2-1.		
DEU-10	University of Hannover	TEL: (+511) 7620
Contact	Institut für Meteorologie und Klimatologie	FAX: (+511) 762-3456
Address:	der Universität Hannover Herrenhäuser Strasse 2 D - 30419 HANNOVER, Germany	E-M/tx: GRUSS@chinook.muk.uni-hannover.de
DEU-10-1	Key-words: MET Clhymet Cl. 1a UnivE-Clima 4-5 years Annual German 1995	
Course Title: <i>Meteorology and climatology within the study in horticulture, landscape architecture and geography</i>		
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):		
Lectures, exercises and seminars in: Advanced Mathematics; Experimental and Theoretical Physics; General Meteorology: Theoretical Meteorology; Synoptic Meteorology; Climatology; Meteorological Instruments; Special Fields of Meteorology and Climatology.		
For detailed information see the university calendar ("Vorleistungsverzeichnis" of the university).		
Entry: See "Qualifications" under course DEU-2-1.		
DEU-11	University of Karlsruhe	TEL: (49-721) 608-3356
Contact	Institut für Meteorologie und Klimaforschung	FAX: (49-721) 608-6102
Address:	der Universität Karlsruhe Kaiserstrasse 12 D - 76128 KARLSRUHE, Germany	E-M/tx: 721166 unikar
DEU-11-1	Key-words: MET Scientific Cl. 1a-1c UnivF-ET&R 5 years Annual German 1995	
Course Title: <i>Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.</i>		
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):		
Lectures, exercises and seminars in: Advanced Mathematics; Experimental and Theoretical Physics; General Meteorology; Theoretical Meteorology (dynamics, thermodynamics); Synoptic Meteorology; Climatology; Meteorological Instruments; Environmental Meteorology; Biometeorology; Turbulent Diffusion; Boundary Layer Meteorology; Cloud Physics; Remote Sensing; Air Chemistry; Atmospheric Turbulence; Atmospheric Radiation.		
The Institut für Meteorologie und Klimaforschung is a joint institute of Karlsruhe University and the Research Centre of Karlsruhe (Forschungszentrum Karlsruhe). The set of courses leads to "Diplom" (equivalent M.Sc.) and Ph.D. The acceptance of students for graduate studies depends on the availability of places for applications, exercises. For detailed information see the university calendar ("Vorleistungsverzeichnis") of the University of Karlsruhe.		
Entry: Qualifying Certificate to study at a German university ("Abitur") or equivalent; Undergraduate or Graduate Studies at a German or foreign university or equivalent institution.		

DEU-12	University of Kiel	TEL: (49-431) 597-3871
Contact	Institut für Meereskunde an der Universität Kiel	FAX: (49-431) 565 876
Address:	Abt. Maritime Meteorologie Dusternbrooker Weg 20 D - 24105 KIEL, Germany	E-M/tlx: met@ifm.uni-kiel.d400 de
DEU-12-1	Key-words: MET Scientific Cl. 1a-1c UnivE-Marin 5 years Annual German 1995	
Course Title: <i>Meteorologie Diplom-Studiengang Meteorologie</i>		
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):		
Lectures, exercises and seminars in: Advanced Mathematics; Experimental and Theoretical Physics; General Meteorology; Theoretical Meteorology; Synoptic Meteorology; Climatology; Meteorological Instruments; Special Fields of Meteorology and Climatology.		
Admission for foreign students: Akademisches Auslandsamt der Christian-Albrecht-Universität; Olshausenstr. 40. For detailed information see the university calendar ("Vorleistungsverzeichnis" of the university).		
Entry: See "Qualifications" under course DEU-2-1.		
DEU-13	University of Köln	TEL: (+221) 470-3682
Contact	Institut für Geophysik und Meteorologie	FAX: (+221) 470-5161
Address:	der Universität zu Köln Kerpener Strasse 13 D - 50923 KOLN, Germany	E-M/tlx: SEK@meteo.uni-koeln.de
DEU-13-1	Key-words: MET Scientific Cl. 1a-1c UnivF-ET&R 4-5 years Biannual German 1995	
Course Title: <i>Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.</i>		
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):		
Lectures, exercises and seminars in: Advanced Mathematics; Experimental and Theoretical Physics; General Meteorology; Theoretical Meteorology; Synoptic Meteorology; Climatology; Meteorological Instruments; Special Fields of Meteorology and Climatology.		
For detailed information see the university calendar ("Vorleistungsverzeichnis" of the university).		
Entry: See "Qualifications" under course DEU-2-1.		
DEU-14	University of Mainz	TEL: (+06131) 392 283
Contact	Institut für Physik der Atmosphäre	FAX: (+06131) 393 382
Address:	Johannes-Gutenberg-Universität Becherweg 21 D - 55099 MAINZ, Germany	E-M/tlx: 4 187 476 uni d
DEU-14-1	Key-words: MET Scientific Cl. 1a-1c UnivF-ET&R 4-5 years Biannual German 1995	
Course Title: <i>Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.</i>		
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):		
Lectures, exercises and seminars in: Advanced Mathematics; Experimental and Theoretical Physics; General Meteorology; Theoretical Meteorology; Synoptic Meteorology; Climatology; Meteorological Instruments; Special Fields of Meteorology and Climatology.		
For detailed information see the university calendar ("Vorleistungsverzeichnis" of the university).		
Entry: See "Qualifications" under course DEU-2-1.		
DEU-15	University of Munchen	TEL: (+089) 2394-4384
Contact	Meteorologisches Institut	FAX:
Address:	der Universität Munchen The resienstrasse 37 D - 80333 MUNCHEN, Germany	E-M/tlx:
DEU-15-1	Key-words: MET Scientific Cl. 1a-1c UnivF-Intl 4-5 years Biannual German 1995	
Course Title: <i>Undergraduate and graduate studies leading to "Diplom" (equivalent M.Sc.) and Ph.D.</i>		

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Lectures, exercises and seminars in: Advanced Mathematics; Experimental and Theoretical Physics; General Meteorology; Theoretical Meteorology; Synoptic Meteorology; Climatology; Meteorological Instruments; Special Fields of Meteorology and Climatology.

For detailed information see the university calender - "Vorleistungsverzeichnis".

Entry: See "Qualifications" under course DEU-2-1.

DEU-16	University of Munich	TEL:	(+089) 2180-3153
Contact	Lehrstuhl für Bioklimatologie und Immissionsforschung der	FAX:	
Address:	Universität München,	E-M/tlx:	
	Hohenbachernstr. 22		
	D -85354 FREISING, Germany		

DEU-16-1 Key-words: MET Clhymet Cl. 1a-1c UnivE-Intl 2-4 years Annual German 1995

Course Title: *Courses in applied/forest/biometeorology for students of forestry, geography and meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Courses are held for students of Forestry, Geography and Meteorology. Main topics are: Forest Meteorology; Human Biometeorology; Urban Climatology; Hydrology; Technical Meteorology and General Climatology.

Entry: See "Qualifications" under course DEU-2-1.

DEU-17	University of Stuttgart	TEL:	(+0711) 685-5423
Contact	Institut für Siedlungswasserbau	FAX:	(+0711) 685-3500
Address:	Wassergute- und Abfallwirtschaft	E-M/tlx:	UNI STUTTGART
	Universität Stuttgart, Bandtäle 1		
	D - 70569 STUTTGART, Germany		

DEU-17-1 Key-words: HYD Clhymet Cl. 1a-1c UnivF-Intl 4-5 years Annual German 1995

Course Title: *Water engineering - Studies leading to "Diplom" (equivalent M.Sc.)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Lectures, exercises and seminars in: Mathematics; Physics; Chemistry; Hydraulics; Construction; Hydrology; Water and Sewage Systems.

For detailed information see "Studienfuhrer Baingenieurwesen".

Entry: See "Qualifications" under course DEU-2-1.

DEU-18	Fachhochschule Nordostniedersachsen Fachbereich Wasserwirtschaft und Kulturtechnik	TEL:	(+05826) - 8051
Contact	Scientific Director Prof Dr Ing Olbrisch, Fachhochschule	FAX:	
Address:	Nordostniedersachsen Fachbereich baingenieurwesen	E-M/tlx:	
	Herbert-Meyer-Str. 7		
	D - 29 556 SUDERBURG, Germany		

DEU-18-1 Key-words: HYD Clhymet Cl. 1b ProfF-Intl 1.5 years Annual German 1995

Course Title: *Water management for tropical areas*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Lectures, exercises and practical work in: Hydrology; Engineering Geology; Hydraulic Structures; Sanitary Engineering; Small Scale Water Power; Irrigation and Drainage; Soil Conservation and Erosion Control; Special Project Studies. For detailed information please contact the above-mentioned institute.

Duration: Postgraduate course, approximately one and a half years. Foreign students accepted, application necessary; appropriate information can be obtained from the above-mentioned institute. Most students have to find private accommodation.

Entry: At least B.Sc. or equivalent university degree in an appropriate subject, such as civil engineering, agriculture, hydrogeology, etc.

DEU-19	University of Hannover	TEL:	(+0511) 762-2237
Contact	Institute for Water Resources Management	FAX:	(+0511) 762-3456
Address:	Hydrology and Agricultural Hydraulic Engineering	E-M/tlx:	09 23868
	University of Hannover, Appelstr. 9 A		
	D - 30167, HANNOVER, Germany		

DEU-19-1 Key-words: HYD Clhymet Cl. 1a UnivE-Intl 5-6 years Annual German 1995

Course Title: *Hydrology, Water Resources Management and Hydraulic Engineering*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Lectures, exercises and seminars in: Surface and Groundwater Hydrology; Hydrometry; Hydraulics; Water Management; Operations Research; Stochastics; System Analysis; Water Quality Management; Urban Hydrology; Water Management and Hydrology for Tropical Areas; Soil Physics; Irrigation; Drainage; Erosion Control; Sedimentation. Courses are part of the study of: Civil Engineering; Geography; Geology; Geodesy Meteorology.

For detailed information see the university calendar (Vorlesungsverzeichnis) and the study guide (Studienfuhrer) of the University of Hannover.

Entry: See "Qualifications" under course DEU-2-1.

GHANA, The Republic of

GHA-1	Meteorological Department Training School	TEL: (233) 76 381
Contact	Meteorological Services Department	FAX:
Address:	P.O. Box 87	E-M/tlx: 22.93 MINWAY GH
	LEGON	
	Ghana	

GHA-1-1 Key-words: MET Observation Cl.4 Proff-Ablni 6 months Ad hoc English 1988

Course Title: *Class IV Meteorologist - Initial Training Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

1. Mathematics.
2. Physics of the atmosphere: temperature; pressure; wind; weather.
3. Practical theoretical work: observational technique; cloud; humidity; surface wind; upper winds; visibility.

Instruments Observation. Presentation of meteorological information.

The Training School exists solely to train staff to fill vacancies in the Department. Candidates for training are recruited into the service and paid allowances while in training. The six-month initial training course is followed by two and a half years of field work under the supervision of qualified class IV meteorologists with the rank of senior technical officer. Final refresher course and examination are conducted at the end of the field work and successful candidates are awarded certificates. No students from other countries.

Entry: West African School Certificate or GCE Ordinary Level Certificate with credit passes in English, Mathematics, Physics/General Science or Geography.

GREECE; The Hellenic Republic

GRC-1	Hellenic National Meteorological Service, Athens	TEL: (30-1) 962-9415						
Contact	Hellenic National Meteorological Service	FAX:						
Address:	Meteorological School P.O. Box 73502 - GR 166 03 HELLINIKO, ATHENS, Greece	E-M/tlx: 21.52.55						
GRC-1-1	Key-words: MET Operational Cl.1b ProfE-Bases 13 months Ad hoc Greek 1988							
Course Title: <i>Training of Class I meteorological personnel (Meteorologists)</i>								
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):								
Additional higher mathematics, statistics, maths lab and programming, thermodynamics of the atmosphere, aeronautical meteorology, climatology, dynamic meteorology, synoptic meteorology, agricultural meteorology, hydrology, meteorological instruments and observations, physical meteorology, marine meteorology, radiometeorology, descriptive meteorology, organization (of a meteorological service, international bodies), practical exercises (synoptic meteorology, aerology and forecasting), computers, messages switching system, telecommunications, etc.), air pollution meteorology, meteorological satellites.								
Frequency: Irregular, according to the requirements of the Service. There are possibilities of accepting students from other countries by bilateral agreements. Students have to find private accommodation.								
Entry: University Diploma in mathematics and/or physics, Air Force Academy. Excellent knowledge of English, French, German or Italian is required.								
GRC-1-2	Key-words: MET AssistForec Cl.2 ProfF-Bases 10 months Ad hoc Greek 1988							
Course Title: <i>Training of Class II meteorological personnel (Meteorological assistants)</i>								
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):								
Elementary and higher mathematics, physics, statistics, thermodynamics of the atmosphere, meteorological instruments and observations, descriptive meteorology with elements of physical meteorology and marine meteorology, dynamic meteorology, aeronautical meteorology, synoptic meteorology, climatology, agricultural meteorology with elements of hydrology, radiometeorology, practical exercises, meteorological satellites.								
Frequency: According to the needs of the Service. Requirements for admission: some experience as observer is necessary and good knowledge of English. There are possibilities of accepting students from other countries by bilateral agreements. Students have to find private accommodation.								
Entry: High School. Previous training as a meteorological observer Class III in the Hellenic National Meteorological Service.								
GRC-1-3	Key-words: MET Observation Cl.3 ProfF-Ablni 4 months Ad hoc Greek 1988							
Course Title: <i>Training of Class III meteorological personnel (Technicians)</i>								
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):								
Elements of descriptive meteorology, meteorological instruments and observations, pilot-balloon observations, special observations at aerodromes, elements of climatology, weather messages and codes, plotting of surface and upper-air charts, elements of agricultural meteorology, elements of statistics, organization of National Meteorological Service, practical exercises.								
Frequency: According to the needs of the Service. There are possibilities of accepting students from other countries by bilateral agreements. Students have to find private accommodation.								
Entry: High School education, good knowledge of English or French.								
GRC-1-4	Key-words: MET Operational Cl.1b ProfS-Radar 4 weeks Ad hoc Greek 1988							
Course Title: <i>Radar Meteorology</i>								
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):								
RADAR FUNDAMENTALS, radar propagation, radar detection and attenuation. PRINCIPAL FUNCTIONS of the weather radar (detection of precipitation, cloud detection, height measurement, character of clouds and precipitation, measurement of echo intensity, echo motion). USES OF RADAR in synoptic meteorology (function in weather analysis and depiction, function in forecasting), selective								

quantative radar techniques, Doppler radars, recent advances in radar instrumentation techniques.

Frequency: According to the needs of the Service. Since the number of places is strictly limited, these courses are reserved in principle for the personnel of the Hellenic National Meteorological Service. From time to time, however, the admission of a number of foreign students may be accepted. Candidates must be officially presented by their Government. Students have to find private accommodation.

Entry: Satisfactory completion of an initial Class I training and practical work in weather observing.

GUYANA, The Republic of

GUY--1 Hydrometeorological Service, Georgetown

TEL: (592-2) 59 550

Contact Chief Hydrometeorological Service

FAX: (592-2) 61 460

Address: Ministry of Agriculture
18 Brickdam, Stabroek
GEORGETOWN, Guyana

E-M/tix:

GUY--1-1 Key-words: MET Observation Cl. 4 ProfF-HyMet 4 months Ad hoc English 1988

Course Title: *Meteorological Technician*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

METEOROLOGICAL TECHNICIAN Course: WMO Class IV Syllabus.

HYDROLOGICAL TECHNICIAN On-the-job Training for: Levelling; Making discharge measurements by wading and from boat with gauging reel; Servicing of water level recorders; Taking water samples; Processing of charts from tidal and non-tidal streams/rivers; Making compass surveys of station sites; Taking sediment samples; Preparing estimates for field trips.

Duration: four months for Meteorological Technician; one year for Hydrometeorological Technician.

Starting date: any time during the year. Foreign students wishing to attend this programme should write to the Chief Hydrometeorological Officer through their Ministries of Foreign Affairs or Embassies.

Entry: Four GCE 'O' level or CXC subjects including English, mathematics and physics.

GUY--1-2 Key-words: MoH AssistForec Cl. 3 ProfF-HyMet 1 year Ad hoc English 1988

Course Title: *On-the-job training for Hydrometeorological Technicians*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

METEOROLOGICAL TECHNICIAN Course: WMO Class III Syllabus.

HYDROLOGICAL TECHNICIAN On the job Training for: Levelling. Making discharge measurements by wading and from boat with gauging reel. Servicing of water level recorders. Taking water samples.

Processing of charts from tidal and non-tidal streams/rivers. Making compass surveys of station sites.

Taking sediment samples. Preparing estimates for field trips.

Foreign students wishing to attend this programme should write to the Chief Hydrometeorological Officer through their Ministries of Foreign Affairs or Embassies.

Entry: Four GCE 'O' Level or CXC subjects including English, mathematics and physics.

HKG-1 Hong Kong Observatory

Contact: Hong Kong Observatory
Address: 134A Nathan Road, KOWLOON
Hong Kong, China

TEL: (852) 2926-8200

FAX: (852) 2721-5034

E-Mail: mailbox@hko.gen.gov.hk

HKG-1-1 Key-words: MET AssistForec Cl.1-2 ProfF-Bases 7 weeks Annual English 1998
Course Title: *Applied Meteorology Course for Forecasters*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

METEOROLOGY OF SOUTHEAST ASIA: general circulation in the tropics, significant relief and weather systems that influence the weather in Southeast Asia, winter monsoon and cold surges, heavy rain in China (Mei-yu), crachin, tropical cyclones. Case studies are organized to familiarize the trainees with various significant weather situations in the Southeast Asia. Use and interpretation of data from satellite, radar, automatic weather stations, NWP products.

CURRENT WEATHER SESSIONS: the trainees will work shifts as duty forecasters in a simulated weather forecasting office.

EXAMINATION: there will be two examinations in the course, one is a written examination and the other an oral examination. The latter examination is to assess the participants' ability in assimilating and analysing weather information, preparing weather forecasts and conducting weather briefings. Certificates will be awarded to candidates who satisfactorily pass the examinations.

The course fee is HK\$36,000 and should be paid in full before the commencement of the course. Payment should be made in the form of a demand Draft payable to the "Hong Kong Government".

Entry: Degree holder of a physical science or engineering subject, having received training in fundamental meteorology, or WMO Class III meteorological personnel with equivalent knowledge in physics and mathematics and with at least two years of relevant experience or equivalent. Proficiency in written and spoken English.

HKG-1-2 Key-words: MET Operational Cl.2 ProfS-Aeron 3 weeks Annual English 1998
Course Title: *Meteorology Course for Aviation Forecasters*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

MODULE I -- Basic and Operational Procedures (1 week). Basic Aviation Meteorology, Operational procedures and weather services at the Hong Kong Airport Meteorological Office; Nowcasting; The application of numerical weather products in aviation weather forecasting. MODULE II -- Attachment to the Hong Kong Airport Meteorological Office (2 weeks).

The course fee is HK\$7,300 and should be paid in full before the commencement of the course. Payment should be made in the form of a demand Draft payable to the "Hong Kong Government".

Entry: WMO Class II Meteorological Personnel. Proficiency in written and spoken English.

HKG-1-3 Key-words: MET Observation Cl.3 ProfE-Bases 16 weeks Annual Chinese 1998
Course Title: *Initial Training Course for Scientific Assistants*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The course consists of two modules. The modules cover basic meteorology, weather observations, coding & decoding of weather information, chart plotting, meteorological instruments, basic radar and satellite meteorology, hydrometeorology and elementary statistics. A one-week attachment to the Central Forecasting Office of the Hong Kong Observatory will be arranged after Module I and before Module II. There will be two examinations in the course, one for each module. Certificates will be awarded to candidates who satisfactorily pass the examinations.

The course fee is HK\$55,000 and should be paid in full before the commencement of the course. Payment should be made in the form of a demand Draft payable to the "Hong Kong Government".

Entry: Grade C or above in mathematics and physics, together with three other subjects, including English Language (Syllabus B) and Chinese Language, at grade E or above in the Hong Kong Certificate Education Examination, or equivalent. Proficiency in written and spoken Chinese as well as an ability to understand written English.

HUN-1 Eötvös Lorand University, Budapest

Contact: Department of Meteorology of
Address: Eötvös Lorand University
H-1083 BUDAPEST, Ludovika 2
Hungary

TEL: (36-1) 343-590
FAX: ()
E-Mail: ()

HUN-1-1 Key-words: MET Operational Cl. 1a UnivE-Bases 5 years Annual Hungarian,E 1998

Course Title: *Course in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

FUNDAMENTAL TRAINING: mathematical analysis, differential equations, elements of linear algebra and vector calculus, computational techniques, experimental and theoretical physics, elements of astronomy, geography, cartography, chemistry and ecology.

METEOROLOGICAL TRAINING: introduction to meteorology, climatology, physics of the upper atmospheric layers, atmospheric physics and chemistry, dynamic meteorology, synoptic meteorology, numerical prediction, long-range weather prediction, satellite meteorology, agrometeorology, hydrology, aviation meteorology, meteorology in environment protection.

Entry:

HUN-1-2 Key-words: MET Scientific Cl. 1b-1c UnivS-E-T&R 2-3 years Annual Hungarian,E 1998

Course Title: *Postgraduate course in meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

According to a personal plan.

Entry:

HUN-2 VITUKI, Budapest

Contact: International Post-Graduate Course on Hydrology
Address: Research Centre for Water Resources (VITUKI)
P.O.Box 27, H-1453 BUDAPEST
Hungary

TEL: (36-1) 215-3043
FAX: (36-1) 216-1514
E-Mail: (61) 224.959 vituk h

HUN-2-1 Key-words: HYD Operational Cl. 1b ProfF-Intl 6 months Annual English 1995

Course Title: *International Postgraduate Course on Hydrology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

MATHEMATICAL METHODS AND COMPUTER APPLICATIONS: mathematics, statistics and probability, numerical methods, computer techniques. GENERAL FLUID MECHANICS: fluid mechanics, open channel hydraulics, numerical hydraulics. GEOSCIENCES: hydrometeorology/climatology, morphometry, soil sciences, geology, geophysical methods in groundwater prospecting, oceanography.

HYDROLOGICAL PROCESSES: introduction, precipitation, evaporation, surface runoff, soil water, groundwater, hydrological field studies. HYDROLOGICAL OBSERVATIONS AND PRIMARY DATA PROCESSING: description of network, criteria for use of data for modelling, hydrometeorological measurement and forecasting, hydrometry, mapping and photo interpretation, primary data processing.

HYDROLOGICAL ANALYSIS AND MODELLING: classification of models, stochastic models, deterministic models, hydrological forecasting. ENVIRONMENTAL ASPECTS: introduction, water chemistry and water biology, surface water quality, subsurface water quality, health and hydrology, water and wastewater treatment, soil conservation and erosion control, forest hydrology, systems approach to managing the aquatic environment. APPLICATION OF HYDROLOGY IN WATER MANAGEMENT: hydrology in reservoir sizing and operation, hydrology in river engineering, hydrology in agricultural water management, urban hydrology, hydrology in water supply, hydrology in water power production, hydrology in coastal engineering, hydrology in water resources management.

The syllabus presumes that the participants have completed training at a sufficient level in elementary subjects related to the course (such as elementary mathematics, physics, chemistry, mechanics, hydraulics and surveying), and possess a sound working knowledge of English. The course's basic objective is to acquaint participants a postgraduate level with advanced theoretical and practical hydrological methods

used in developing water resources management. First, disciplines serving hydrological studies are reviewed, followed by thorough analyses of hydrological processes, the measuring thereof, as well as of their theoretical approaches. Second, using the acquired knowledge as a base, it is shown how in the individual branches of water resources management the hydrological aspects should be approached and their related problems solved. It has been found necessary that the teaching of hydrology should be linked in all its relevant aspects with environmental protection, so as to reflect also an appropriate environmental emphasis. The course curriculum includes ample practical exercises. Further, an assessment of the study results is provided for through tests, exams and an individually written closing paper. Participation fee US\$ 10,000, covering instruction and practical training, the use of laboratory, computer, etc., facilities, expenses of received publications and of field trips, as well as medical care in Hungary for the whole duration of the course, accommodation, local transportation and a subsistence allowance in local currency; but not travelling to and from Budapest.

Entry: University degree (minimum B.Sc.) in hydrological sciences, civil engineering or related disciplines.

INDIA, The Republic of

IND-1	Meteorological Training Centre, New Delhi	TEL: (91-11) 461-1842
Contact	India Meteorological Department, Training Centre	FAX: (91-11) 469-9216
Address:	Upper-air Instruments/Telecommunication Division Mausam Bhavan, Lodi-Road NEW DELHI 110-003, India	E-M/tlx: 316.64.12 MDGM-IN

IND-1-1 Key-words: MET InstrumEquip Cl. 1b ProfF-Instr 4 months Annual English 1995

Course Title: *Intermediate Course (Instrumentation)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Elementary radio course. General description of radiosonde, radiowind radar system. Meteorological satellite system, surface meteorological instrumentation. Practical observational training.

Starting date and frequency of course: 20 January and 20 May (even calendar years); 20 March (odd calendar years). No fees. For further information, please contact the Office of the Deputy Director General of Meteorology (Upper Air Instruments).

Entry: B.Sc. Physics.

IND-1-2 Key-words: MET InstrumEquip Cl. 1b ProfS-Instr 6 months Annual English 1995

Course Title: *Advanced Course (Instrumentation)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Advanced electronics. Detailed theoretical/practical (on-the-job) training in radiosonde; radiowind; radar system. Satellite meteorological instrumentation, aeronautical instruments.

Starting date and frequency: even calendar years, 20 September. Odd calendar years, 20 July. This course is basically meant for maintenance personnel (six months' duration). A candidate has to successfully undergo the Intermediate course of four months before entry to the Advanced course. In addition to the regular training courses outlined above, special courses for the departmental, extradepartmental and foreign candidates are also conducted from time to time. No fees. For further information, please contact the Office of the Deputy Director General of Meteorology (Upper Air Instruments).

Entry: M.Sc. in Physics or Bachelor's degree in Engineering (Electrical/Telecommunications/Electronics).

IND-1-3 Key-words: MET InstrumEquip Cl. 3 ProfF-Telec 4 months Semest English 1995

Course Title: *Meteorological Telecommunication Operator's Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Operational Training in Morse transmission and reception, HF/VHF transceivers, facsimile and radio teletype equipments, electronic teleprinter, data punching, formatting including WMO procedures, etc. Collection and dissemination of data in an automated centre. Theory of general electricity, electronics, telegraphy for low level working.

Limited boarding facility available. Courses are normally held in the 2nd week of May & September every year, to enable a person to be well versed in the operation of various telecommunication equipment, transmission and reception of data through computers, etc. For further information, please contact the Office of Director General of Meteorology (Telecommunication Division).

Entry: Bachelor's degree in Science with Physics as one of the subjects.

IND-1-4 Key-words: MET InstrumEquip Cl. 1b ProfF-Telec 4 months Annual English 1995

Course Title: *Intermediate course in meteorological telecommunication*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction of Telecommunication networks and traffic including WMO procedures, format and practices. Theory of electricity; semiconductor and integrated circuits; rectifiers; amplifiers; oscillators; modulation and demodulation; introduction to digital electronics and operational amplifiers; wave propagation; transmission line, antenna theory; radio regulation; telegraphy; radio receivers and transmitters; introduction to radar; radiosonde; satellite. Study of communication equipment viz WT/FAX/RTT, equipment maintenance; practice in T/P transmission, morse signalling; brief attachment to data switching computer.

Limited boarding facility available. Course is held in the 2nd week of January every year, to enable a person to be well versed in maintenance of various types of telecommunication equipment. For further

information, please contact the Office of Director General of Meteorology (Telecommunication Division).
Entry: B.Sc. with Physics as one of the subjects. Basic training in meteorology is desirable.

IND-1-5 Key-words: MET InstrumEquip Cl.1b ProfS-Telec 6 months Ad hoc English 1995

Course Title: *Advanced course in meteorological telecommunication*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Detailed study of test equipment; radio teletype system; Facsimile system; HF/VHF systems; microprocessors, microcomputer; electronic teleprinter; message switching computers; radiosonde/radiowind system; principles of radar; radar meteorology, weather radar; satellite equipment and systems used in meteorological applications; theory of line communication and systems, operational amplifiers and their application; digital communication and data transmission system; microwave communication; computer technology for high level working.

Limited boarding facility available. Course is normally held in the 2nd week of May every year, to enable the person to be well versed in Computer-based Telecommunication/Technology and up-keep of telecommunication equipment. For further information, please contact the Office of Director General of Meteorology (Telecommunication Division).

Entry: M.Sc. in Physics/Electronics or equivalent; or B.Sc. in Electronics/Telecommunication.

IND-2	Meteorological Training Centre, Shivaji Nagar, Pune	TEL: (91-0212) 325 211
Contact	India Meteorological Department	FAX: (91-0212) 323 201
Address:	Office of the Deputy/Additional Director General Weather Forecasting/Agricultural Meteorology Division Shivaji Nagar, PUNE - 411 005, India	E-M/tlx: 0145 7227 MPNA IN

IND-2-1 Key-words: MET Observation Cl.4 ProfF-Ablni 4 months Trimest English 1995

Course Title: *Basic Meteorology Course in General Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

METEOROLOGICAL THEORY: Instruments and Methods of Observation; Recording of Surface Observations; Methods of Upper-wind Observations; Computation of Meteor report; Codes - Surface, Ship, Upper-Air, Temp and Aviation; Charting - charting of surface chart, upper air chart, constant pressure chart and tephigrams. Special lectures on agrometeorology; telecommunication; meteorological instruments and seismology.

The course commences on second Monday of January, May and September. The course is organised at New Delhi, Calcutta and Madras. Lodging and boarding arrangements are available on request in the trainees' hostel. The charges for lodging and boarding are to be borne by the trainee. The rates are affordable and are being subsidised. At present, no fees, but levy of tuition fee is under consideration.

Entry: Matriculation (Secondary School Certificate).

IND-2-2 Key-words: MET AssistForec Cl.3 ProfS-Intrm 4 months Trimest English 1995

Course Title: *Intermediate training in general meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Dynamic meteorology, physical meteorology, meteorological statistics, climatology, synoptic meteorology, thermodynamics and radiation. Practical: Exercises in chart reading, climatological charts, surface charts, upper-air charts, preparation of flight forecast, preparation of TREND forecast, inspection of observatories including barometer comparison, analysis of tephigram, statistical exercises and computation.

Attachments for familiarisation to the Instrument Division, Agricultural Meteorology Division and the Meteorological Observatory.

The course commences on second Monday of March, July and November. The course is organized at Pune & New Delhi. Lodging and boarding arrangements are available on request in the trainees' hostel. The charges for lodging and boarding are to be borne by the trainee. The rates are affordable and are being subsidised. At present, no fees, but levy of tuition fee is under consideration.

Entry: B.Sc. with physics and mathematics (Higher Secondary Certificate with physics and mathematics also considered) with Class IV level training.

IND-2-3 Key-words: MET AssistForec Cl.1a-2 ProfS-Advan 10 months Annual English 1995

Course Title: *Advanced Meteorologist Course in General Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Dynamic Meteorology; Physical Meteorology; Climatology; Statistics; Synoptic Meteorology; Computer Programming; Oceanography; Hydrometeorology; Satellite Meteorology; Numerical Weather Prediction; Numerical Analysis; Map discussions; Practical Weather analysis and forecasting; Project work. On-the-job training for one month following attachment to operational offices.

The course commences on second Monday of November at Pune. Lodging and boarding arrangements are available on request in the trainees' hostel. The charges for lodging and boarding are to be borne by the trainee. The rates are affordable and are being subsidised. At present, no fees, but levy of tuition fee is under consideration.

Entry: M.Sc. in physics, mathematics or statistics (Graduate degree holders in physics/mathematics also considered) with Class IV level training.

IND-2-4 Key-words: MET Operational Cl.1b ProfS-Rfrsh 15 days Ad hoc English 1995

Course Title: *Advanced refresher course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Drawn up as per requirement for updating the knowledge in specialized fields like: Hydrometeorology; Agricultural Meteorology; Aviation Meteorology; Cyclone Warning; Numerical Weather Prediction; etc.

Lodging and boarding arrangements are available on request in the trainees' hostel. The charges for lodging and boarding are to be borne by the trainee. The rates are affordable and are being subsidised.

Entry: M.Sc. in Physics, Mathematics or Statistics (B.Sc. with Physics and Mathematics also considered).

IND-2-5 Key-words: ENV AssistForec Cl.1b-3 ProfF-Agric 6 months Biennial English 1995

Course Title: *Training in Agricultural Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Agrometeorological instruments, their maintenance and observations; Micro-meteorological observations, soil characteristics observations; Microclimatology, crop weather relationship studies, radiation and energy balance of crops; Evaporation and evapotranspiration, climatic water balance, soil-crop-water relationship; Soil and air temperature; Agrometeorology of droughts, their forecasts and monitoring; Agroclimatology of crops pests and diseases of crops, including desert locust, weather forecasts and advisories for farmers, crop yield forecasts and dry farming statistics; Remote sensing technique, weather hazards affecting crops.

Duration: six months for Class I, Class II, Class III personnel. Foreign trainees' course in Agricultural Meteorology. Twice a year starting 1st January and 1st July. For further information please contact the Office of the Additional Director General of Meteorology (Agricultural Meteorology Division) at the above-mentioned address; also cable AGRIMET SN.

Entry: B.Sc. degree in science.

IND-2-6 Key-words: MET Scientific Cl.1b ProfS-DataP 3-6 months Ad hoc English 1995

Course Title: *Fortran Programming, Electronic Data Processing, Archival and Data Management*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction to data formats and computers; Fortran Programming Language; Electronic Data Processing of surface, upper-air, rainfall, agrometeorological data, etc.; Archival and retrieval of data; Data Management; Familiarisation with real-time data processing.

For further information please contact the Office of the Additional Director General of Meteorology (Research Division) at the above-mentioned address; also cable Weather Pune.

Entry: Preferably a Science Graduate with some computer background.

IND-3 Anna University

TEL: 235-1075

Contact Dr N.V. Pundarikanthan, Director,

FAX: 235-3312

Address: Centre for Water Resources and Ocean Management, Anna University
Madras - 600025 India

E-Mtlx: annalib@sinetm.ernet.in

IND-3-1 Key-words: ENV Scientific Cl.1c UnivE-Ocean 3-5 years Biannual English 1995

Course Title: *Ph.D. Programme in Environmental, Earth or Marine Sciences*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Custom need; topics: Research and Development in Environmental Geology, Marine Pollution, Coastal Ecosystem, Coastal Management, Greenhouse Gases, etc.

Students applying for Ph.D. can be admitted at any time during the academic year. The screening committee will evaluate the suitability of the candidate for the Ph.D. programme. If selected, hostel facilities, as well as departmental facilities will be made available. Approximate tuition fee is Rs 1500 per semester. Doctoral committee will suggest four courses to be done related to the Ph.D. topics. Duration of the course is three to five years.

Entry: M.Sc. or M.Phil. in Environmental, Earth, or Marine Sciences. Master's degree in Engineering (Hydrology or Environmental Engineering), M.Tech. (Remote Sensing).

IND-3-2 Key-words: HYD Scientific Cl.1c UnivE-Water 18 months Biannual English 1995

Course Title: *M.E. Irrigation and Water Management*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

I SEMESTER: Applied Probability and Stochastic Processes; Applied Closed Conduit and Open Channel Flow; Irrigation Practices; Soil Science and Agronomy; Electives I and II.

II SEMESTER: Project Planning and Management; Electives III-VII; Seminars.

III SEMESTER is devoted to the Project Work/Thesis;

ELECTIVES: Water Resources Engineering; Surface and Ground Water Hydrology; Soil and Water Conservation; Irrigation Water Quality and Environment; Drainage and Land Reclamation; Irrigation Systems Management; Sociological Aspects of Irrigation; Agricultural Economics; Practical Training (four weeks); Mini project; Directed Study.

The number of students accepted annually is 15. Hostel with boarding facilities will be made available for the students. This course, which consists of three semesters, commences on 1 August every academic year. During the first 2 semesters, theory and practical subjects will be taught. The last semester is allocated for thesis work. A candidate may be permitted to choose electives from Postgraduate Programmes either within the faculty or from other faculties of the University, up to a maximum of six credits during the period of his/her study.

Entry: Bachelor's degree in Civil Engineering, Agricultural Engineering.

IND-3-3 Key-words: HYD Scientific Cl.1c UnivE-Water 18 months Biannual English 1995

Course Title: *M.E. Hydrology and Water Resources Engineering*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

I SEMESTER: Applied Probability and Stochastic Processes; Fluid Mechanics; Free Surface Flow; Hydrology; Groundwater Hydrology; Elective I.

II SEMESTER: Electives II-VII and Seminar.

III SEMESTER is devoted to Practical Training (4 weeks) and Project Work.

ELECTIVES: Water Resources Planning; Advanced Hydrologic Analysis and Design; Water Resource Systems Analysis; Flood Estimation and Control; Remote Sensing Applications in Water Resources; Mini Project; Directed Study.

The number of students accepted annually is 15. Hostel with boarding facilities will be made available for the students. This course, which consists of three semesters, commences on 1 August every academic year. During the first two semesters, theory and practical subjects will be taught. The last semester is allocated for thesis work. A candidate may be permitted to choose electives from Postgraduate Programmes either within the faculty or from other faculties of the University, up to a maximum of six credits during the period of his/her study.

Entry: Bachelor's degree in Civil Engineering.

IND-3-4 Key-words: HYD Scientific Cl.1b UnivE-HyMet 3 weeks Ad hoc English 1995

Course Title: *Training on Hydrometeorological data collection*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Hydrology, Ground Water Hydrology, Irrigation Management, Hydrometry, Remote Sensing in Water Resources.

Hydrometeorological training is to inculcate the need for precise data collection and to impart knowledge on digital data acquisition. Emphasis: Errors involved in conventional data collection and to improve upon its accuracy for better estimation. This Centre, with the latest digital weather data acquisition and conventional data collection, is in a position to impart the training needed on data collection aspect, which of late, is very much needed in the content of improving computing facilities in all the departments.

Entry: Bachelor's degree in Civil Engineering, Agricultural Engineering.

IND-3-5 Key-words: MOH Operational Cl. 1b UnivE-Water 3-4 weeks Ad hoc English 1995

Course Title: *Refresher Course on "Basin Management"*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):
Custom need.

Twenty to twenty-five participants can undergo the "Refresher Course". Hostel and lodging facilities will be made available for the participants.

Entry: Degree in Civil Engineering, Agricultural Engineering.

IND-4	Cochin University of Science and Technology	TEL: (91-48) 436-3950
Contact	Head, Physical Oceanography and Meteorology Division;	FAX: (91-48) 453-2495
Address:	School of Marine Sciences	E-M/tlx: register@cochinu.ernet.in.
	Cochin University of Science and Technology	
	KOCHI - 682 016 India	

IND-4-1 Key-words: MET Scientific Cl. 1c UnivE-ET&R 4 semest Annual English 1995

Course Title: *M.Sc. - Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

I SEMESTER: Geophysical Fluid Dynamics, Applied Mathematics, Introductory Physical Oceanography, Physical Meteorology, Practical training in computational mathematics and Physical Meteorology.

II SEMESTER: Remote Sensing, Meteorological Instruments, World Climatology, Cloud Physics and Atmospheric Electricity, Computer Programming, Practical training in Meteorology and Oceanography Instruments.

III SEMESTER: Air-Sea Interaction, Dynamical Meteorology, Synoptic & Tropical Meteorology, Middle Atmosphere, Practical training in weather analysis and meteorological computations.

IV SEMESTER: Atmospheric Modelling, Applied Meteorology, Practical training in Lab Modelling and Project Dissertation.

Facilities for carrying out research in the following subjects: Climatic Variability; Environmental Meteorology; Middle Atmosphere; Agricultural Meteorology; Hydrology; Monsoon Dynamics; Air Pollution Meteorology.

Entry: B.Sc. degree with Physics or Mathematics as main subject.

IND-4-2 Key-words: MET Scientific Cl. 1c UnivE-ET&R 1.5 years Annual English 1995

Course Title: *M.Tech. in Atmospheric Science*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

I SEMESTER: Bridge course 1, Observational Techniques, Physical Meteorology, Fundamentals of Dynamic Meteorology and Practical training in Meteorological Computations.

II SEMESTER: Tropical Meteorology, Advanced Dynamics, General Circulation and Climate.

III SEMESTER: Internship, Project or Dissertation.

Facilities for carrying out research in the following subjects: Climatic Variability; Environmental Meteorology; Middle Atmosphere; Agricultural Meteorology; Hydrology; Monsoon Dynamics; Air Pollution Meteorology.

Entry: M.Sc. Degree with meteorology, oceanography, physics or mathematics as main subject and pass in graduate aptitude test or joint national UGC-CSIR text.

IND-5	Banaras Hindu University	TEL: 310 291
Contact	Head of the Department of Geophysics	FAX: 312 059
Address:	Banaras Hindu University	E-M/tlx: Enquire from Dpt of Journalism/Central Office.
	BANARAS Hindu University	
	Varanasi - 221 005, India	

IND-5-1 Key-words: GEO Scientific Cl. 1c UnivE-Bases 3 years Annual English 1995

Course Title: *M.Sc. (Tech.) Course in Geophysics - specialization in meteorology or exploration geophysics*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Mathematical methods; general meteorology; general geophysics; geoexploration; geohydrology, elements

of geology, electronics; seismology; physical meteorology; dynamic meteorology; climatology; agricultural meteorology; synoptic meteorology; advanced dynamic meteorology; remote sensing.

Six candidates in meteorology with the provision of accepting additional students from other countries sponsored by the Government of India. Hostel facility for accommodation exists. Fees Rs. 220 payable in four instalments.

Entry: Graduate degree in science with physics and mathematics as compulsory subjects.

IND-6	Indian Institute of Technology, Kharagpur	TEL: (03222) 2221-2224
Contact	Head, Department of Physics and Meteorology	FAX: 91 3222 2303
Address:	Indian Institute of Technology Kharagpur - 721 302, India	E-M/tlx: basswat@phr.iitkgp.ernet.in

IND-6-1 Key-words: MET Scientific Cl.1c ProfE-Atmos 18 months Annual English 1995

Course Title: *M.Tech. in Atmospheric Science and Technology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Dynamic meteorology; physical meteorology; synoptic meteorology & nowcasting; numerical weather prediction; climatology; weather satellites and radars; atmospheric pollution; cloud physics; computer software; air-sea interaction; statistical methods in meteorology; principles and applications of microprocessor-based system; applied meteorology; meteorological/modelling laboratories.

Foreign nationals would be considered for admission if their application is received through the ministry of Human Resource Development (HRD), Government of India, as well as the concerned embassy. They should also submit documentary evidence regarding the source of the financial support which they will be getting during their full-time study at the Institute. The candidate will normally be required to live on the Institute campus. For fees and other details, the candidates may contact: The Deputy Registrar (Academic); Indian Institute of Technology Kharagpur - 721 302.

Entry: M.Sc. (Physics or Mathematics) or B.Tech. (Electronics & Communication Engineering) + GATE or Sponsorship.

IND-7	University of Roorkee	TEL: (01332) 72349
Contact	Professor and Head	FAX: 091-1332-73560
Address:	Department of Hydrology University of Roorkee ROORKEE 247667, India	E-M/tlx: 0597-201 UOR IN

IND-7-1 Key-words: HYD Scientific Cl.1a UnivF-ET&R 12-16 mont Annual English 1995

Course Title: *25th International Postgraduate Diploma and Master's Course in Hydrology. Also Ph.D. programme*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

A: POSTGRADUATE DIPLOMA. (i) CORE COURSES: Hydrologic Elements and Analysis; Computer Methods; Probability and Statistics in Hydrology; Mathematics; Channel and Fluvial Hydraulics; Water Resources Planning and Management; Stochastic Hydrology; Water Quality and Environment; and Agricultural Hydrology/Remote Sensing Applications in Hydrology. (ii) SPECIALIZED COURSES: "Surface Water Stream": Hydrometeorology, System Analysis and Surface Water Planning, Parametric Hydrology; Geohydrology; "Ground Water Stream": Hydrogeology, Ground Water Hydrology, System Analysis and Ground Water System, Geophysical Investigations; "Watershed Management Stream": Hydrometeorology, Planning and Management of Watershed, Watershed Behaviour and Conservation Practices, System Ecology and Environmental Planning.

B: MASTER'S PROGRAMME. Master's Programme can be completed either by Dissertation or by Course Work. For Dissertation, prescribed duration of 4.5 months may be exceeded.

C: RESEARCH PROGRAMME. Research Work can be pursued in any of the three options for specialization at Postgraduate level: (i) Surface Water Hydrology; (ii) Ground Water Hydrology; (iii) Watershed Management.

UNIVERSITY CAMPUS and INSTRUCTIONS. Roorkee is a small town in Haridwar district of Uttar Praesh. Its elevation is 261 m above mean sea level. It is located near the Himalayan foot hills and is within easy reach from New Delhi, the capital of India, the distance being about 180 km by road. It is also connected by rail. Roorkee University is fully residential. As per the prevalent regulations, all foreign students coming to India for the Postgraduate Course are required to get checked for the AIDS Virus

before they depart from their countries for studies (in India), irrespective of the fact that they will again be checked for the AIDS Virus when they arrive for the course.

FEES. No tuition fee is charged by the Department for imparting education from the participants getting any fellowship awarded by the Government of India or by the University. The trainees, however have to bear their own boarding, lodging and other expenses. Approximate figures are as follows: Boarding and lodging, Rs. 20,000; Field Trips, Rs. 10,000; Books, stationery, lecture notes, Rs. 5,000; Computer dues Rs. 5,000; Outfit and Medical expenses, Rs. 3,000. NOMINATED CANDIDATES - Eligible candidates officially nominated through various agencies (not covered under the fellowships clause) can also be admitted provided the sponsors give an undertaking that all expenses including the teaching cost will be borne by the sponsors for which the payment to the University will be made in advance. Such applications should come through the Indian Embassy/Legation in that Country to Prof & Head. The University authorities will communicate the amount of advance payments to be made to this effect and the offer of admission.

Entry: B.Sc. in Civil/Mechanical/ Agricultural Engineering; Hydrology; or M.Sc. in various related disciplines.

IRAN, The Islamic Republic of

IRN-1 Iranian Meteorological Organization, Tehran

TEL: (98-21) 600-4041

Contact Permanent Representative with WMO

FAX: (98-21) 646-9044

Address: Iranian Meteorological Organization

E-Mail: OASCMO@ROSE.IPM.AC.IR

P.O. Box 13185-461, TEHRAN

Islamic Republic of Iran

IRN-1-1 Key-words: MET Observation Cl.4 Proff-Ablni 1 year Ad hoc Persian,E 1995

Course Title: *Training of Class IV meteorological personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

LECTURES (9 months): General mathematics I and II, basic physics I and II, general meteorology I, earth sciences, English language I and II, Islamic culture I and II, codes and methods of observation, surface instruments, upper air.

ON-THE-JOB TRAINING (3 months).

Number of students varies as required. All students are usually accommodated by the Institute. No fees.

Entry: Complete high school education in mathematics and/or physics, natural sciences, or equivalent.

Adequate knowledge of English is required.

IRN-1-2 Key-words: MET Technician Cl.3 Proff-Bases 3 semesters Ad hoc Persian,E 1995

Course Title: *Training of Class III meteorological personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

REFRESHER COURSE (2 months) including mathematics, physics and general meteorology.

PROFESSIONAL TRAINING: general meteorology II, fundamentals of aeronautical meteorology, meteorological telecommunication, agricultural meteorology, heat and thermodynamics, English language III, elementary computer and programming, climatology I, introduction to hydrological meteorology, introduction to air pollution meteorology, practical application of computer, physical chemistry, electronics, radiation and its instruments.

ON-THE-JOB TRAINING (3 months).

Number of students varies as required. All students are usually accommodated by the Institute. No fees.

Entry: Class IV Certificate meteorological personnel and two years' experience.

IRN-2 Tehran Islamic Azad University, Tehran North Branch

TEL: (98-21) 600-4041

Contact Permanent Representative with WMO

FAX: (98-21) 646-9044

Address: Iranian Meteorological Organization

E-Mail: OASCMO@ROSE.IPM.AC.IR

P.O. Box 13185-461, TEHRAN

Islamic Republic of Iran

IRN-2-1 Key-words: MET Scientific Cl.1c UnivE-Atmos 2 years Annual Persian,E 1995

Course Title: *M.Sc. programme, with specialization in Dynamic or Synoptic Meteorology (DM, SM)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PREREQUISITE: General meteorology, atmospheric physics, physical meteorology I, dynamic meteorology I, synoptic meteorology I and II.

GENERAL TRAINING: Physical meteorology II, dynamic meteorology II, synoptic meteorology III, micrometeorology, cloud physics, statistics in meteorology I, numerical weather prediction laboratory I.

DYNAMIC METEOROLOGY BRANCH: numerical weather prediction I and II, numerical weather prediction laboratory II, time series and spectral analysis.

SYNOPTIC METEOROLOGY BRANCH: prediction of meteorological phenomena, elements of numerical weather prediction, satellite meteorology II, tropical meteorology.

OPTIONAL: aeronautical meteorology I and II, satellite meteorology I, marine meteorology I and II, radar meteorology, climatology I and II, numerical analysis.

Limited number of grants may occasionally be available. The capacity of the course is 16 students, usually accommodated by the university. No fees. Further information from: Iran Islamic Azad University, Tehran North Branch. Tel: (98-21) 646.90.47; Fax: (98-21) 600.04.17; Tlx: 22.42.44 METI IR.

Entry: B.Sc. in Physics, Mathematics or Meteorology

IRN-2-2 Key-words: MET Scientific Cl.1a UnivE-Atmos 4 years Annual Persian 1995

Course Title: *B.Sc. programme in physics, with specialization in meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PART I covers more than 3 years (six semesters) and includes basic sciences in physics and mathematics, as normally required in a B.Sc. physics degree course.

PART II includes general meteorology, atmospheric physics, physical meteorology I, dynamic meteorology I, synoptic meteorology I and II, optional topics project work.

Number of students varies as required. Language of the course: Persian; only meteorological subjects may be conducted in English. All students are usually accommodated by the university. No fees.

Entry: Complete high school education in mathematics and/or physics, natural sciences, or equivalent.
Adequate knowledge of English is required.

IRN-2-3	Key-words: GEO Operational	Cl. 1a	UnivF-Bases	4 years	Annual	Persian	1995
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Course Title: *B.Sc. programme in meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PART I covers more than 3 years (six semesters) and includes basic sciences in physics and mathematics, as normally required in a B.Sc. physics degree course.

PART II includes general meteorology, atmospheric physics, physical meteorology I, dynamic meteorology I, synoptic meteorology I and II.

Number of students are usually accommodated by the university. No fees.

Entry: Complete high school education in mathematics and/or physics, natural sciences, or equivalent.
Adequate knowledge of English is required.

IRN-3	Institute of Meteorology and Atmospheric Sciences, Tehran	TEL:	(98-21) 600-4041
Contact	Permanent Representative with WMO	FAX:	(98-21) 646-9044
Address:	Iranian Meteorological Organization P.O. Box 13185-461, TEHRAN Islamic Republic of Iran	E-Mail:	OASCMO@ROSE.IPM.IR

IRN-3-1	Key-words: MET Observation	Cl. 2	ProfF-Bases	2 years	Annual	Persian,E	1995
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Course Title: *Training of Class II meteorologist*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Refresher course (two months), including general mathematics, general physics, thermodynamics, general meteorology, climatology, vector analysis, differential equations, analytical mechanics I and II, general meteorology III, cloud physics, atmospheric physics, English language IV, Islamic culture III, mathematical physics, statistical mechanics, air pollution, physical meteorology, marine meteorology, dynamic meteorology I and II, synoptic meteorology I and II, quantum mechanics, hydrodynamics, satellite meteorology, climatology II, micrometeorology, hydrometeorology, aeronautical meteorology, project work or seminar.

Number of students varies as required. All students are usually accommodated by the Institute. No fees.

Entry: Class III Certificate meteorological personnel and two years' experience.

IRN-3-2	Key-words: MET Operational	Cl. 1b	ProfE-Bases	18 months	Annual	Persian,E	1995
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Course Title: *Training of Class I meteorologist - postgraduate diploma course in meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PREREQUISITE: General meteorology, atmospheric physics, physical meteorology I, dynamic meteorology I, synoptic meteorology I and II.

GENERAL TRAINING: Physical meteorology II, dynamic meteorology II, synoptic meteorology III, micrometeorology, cloud physics, statistics in meteorology I, numerical weather prediction laboratory I, elements of numerical weather prediction, optimal topics, research and thesis.

Number of students varies as required. All students are usually accommodated by the Institute. No fees.

Entry: Class III Certificate meteorological personnel and two years' experience.

IRN-4	University of Tarbiat Modaress, Tehran	TEL: (98 21) 600-4041
Contact	Permanent Representative with WMO	FAX: (98 21) 646-9044
Address:	Iranian Meteorological Organization	E-M/tlx: OASCMO@ROSE.IPM.AC.IR
	P.O. Box 13185-461, TEHRAN	
	Islamic Republic of Iran	

IRN-4-1 Key-words: MET Scientific Cl.1b UnivE-Atmos 2 years Ad hoc Persian,E 1995

Course Title: *Equivalent to M.Sc. in Synoptic or Dynamic Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PREREQUISITE: general meteorology, atmospheric physics, physical meteorology I, dynamic meteorology I, synoptic meteorology I and II.

GENERAL TRAINING: Physical meteorology II, dynamic meteorology II, synoptic meteorology III, micrometeorology, cloud physics, statistics in meteorology I, numerical weather prediction laboratory I.

DYNAMIC METEOROLOGY BRANCH: numerical weather prediction I and II, numerical weather prediction laboratory II, time series and spectral analysis.

SYNOPTIC METEOROLOGY BRANCH: prediction of meteorological phenomena, elements of numerical weather prediction, satellite meteorology II, tropical meteorology.

OPTIONAL: aeronautical meteorology I and II, satellite meteorology I, marine meteorology I and II, radar meteorology, climatology I and II, numerical analysis.

Further information from: University of Tarbiat Modaress, Tehran; Tel: (98-21) 646.90.47; Fax: (98-21) 600.04.17; Tlx: 22.42.44 METI IR.

Entry: B.Sc. in Meteorology, Physics, Mathematics or Electronics.

IRAQ, The Republic of

IRQ--1	Regional Meteorological Training Centre, Baghdad	TEL: (964-1) 556-0070
Contact	Iraqi Meteorological Organization	FAX:
Address:	Regional Meteorological Training Centre	E-M/tx: 21.42.02 MET IK
	Almansoor, P.O. Box 6078	
	BAGHDAD, Iraq	

IRQ-1-1 Key-words: MET PredictForec Cl.1b-2 ProfF-Aeron 6 months Annual Arabic,E 1995

Course Title: *Forecaster course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Physical meteorology. Dynamic meteorology. Synoptic meteorology. Methods of observation. Codes and plotting. General climatology. Meteorological analysis and forecasting. On-the-job training.

This course is designed to enable the trainees to prepare specialized aviation weather forecasts and warnings for regions in the vicinity of airports. Course starts in March; class capacity 5-10 students. Fees (1996/97) \$ 4000.

Entry: B.Sc., physics or mathematics.

IRQ-1-2 Key-words: MET Observation Cl.4 ProfF-Abini 3 months Annual Arabic,E 1995

Course Title: *Initial observer course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Preliminary Studies: a) Meteorological Organization; b) Earth Science. General Meteorology. Methods of observation. Surface synoptic observations. Meteorological codes. Chart plotting. Meteorological surface instruments.

This course is designed to prepare persons for a career as a meteorological observer; these studies are primarily concerned with weather observations made at, or near, ground using instruments at the level. Course starts in October. Class capacity 5-10 students. Fees (1996/97) \$ 2,000.

Entry: Secondary school certificate.

IRQ-1-3 Key-words: MET Observation Cl.3-4 ProfF-Aerol 3 months Ad hoc Arabic,E 1988

Course Title: *Upper-air observer course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Preliminary studies: a) Meteorological Organization; b) Earth Science. General Meteorology. Methods of upper-air observations. Surface synoptic observations. Meteorological codes. Upper-air instruments.

This course is primarily concerned with meteorological observations of the upper atmospheric layers using pilot balloons, radiosonde, and radio radar wind equipment to prepare persons for a career as an upper-air meteorological observer. Fees (1988) ID 500.

Entry: Secondary school certificate with experience in meteorological observation.

IRQ-1-4 Key-words: MET Observation Cl.4 ProfF-Agric 3 months Ad hoc Arabic,E 1988

Course Title: *Agrometeorology observer course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General meteorology. Microclimatology. Soil moisture and temperature. Weather hazards. Applications to agriculture. Agrometeorological observations.

This course is primarily concerned with agrometeorological observations to prepare persons who will make specialized meteorological observations for agriculture. Fees (1988) ID 250.

Entry: Agriculture school graduate.

IRQ-1-5 Key-words: MET Observation Cl.4 ProfF-Marin 3 months Ad hoc Arabic,E 1988

Course Title: *Marine observer course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General marine meteorology. Marine climatology. Marine instruments and methods of observations. Surface marine observations. Surface weather reports from ships. Chart plotting.

This course is primarily concerned with meteorological surface marine observations, to prepare persons for duties as a marine meteorological observer. Fees (1988) ID 250.

Entry: Secondary school certificate experience in surface meteorological observation.

IRQ--1--6 Key-words: MET InstrumEquip Cl.2-3 ProfF-Instr 3 months Ad hoc Arabic,E 1988

Course Title: *Surface instruments technician course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General meteorology. Instrumental science. Principles of instrumental measurements. Calibration and repair of instruments. Workshop and laboratory practice. Principles of meteorological measurements. Surface instrument measurements.

This basic course is for technicians whose duties involve the calibration, maintenance and repair of meteorological instruments used on or near earth's surface. On completion of the course the technicians could later undertake specialized studies in meteorological instrumentation. Practical classes are conducted in the workshops and calibration laboratory of the RMTC. Fees (1988) ID 250.

Entry: Technical school certificate with experience in meteorological observation.

IRELAND

IRL-1 Meteorological Training Centre, Galway TEL: (353-1) 842-4411
 Contact: The Director FAX: (353-1) 837-5557
 Address: Irish Meteorological Service E-M/tlx: 914.44
 Glasnevin Hill
 DUBLIN 9, Ireland

IRL-1-1 Key-words: MET PredictForec Cl.1a ProfS-Rfrsh 10 months Ad hoc English 1988

Course Title: *Training of Meteorologists*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PHYSICAL METEOROLOGY. Thermodynamics of dry and moist air; atmospheric statics; radiation; physics of clouds and precipitation. DYNAMIC METEOROLOGY. Equations of motion of atmosphere; circulation and vorticity; quasi-geostrophic equations; linear perturbation theory; baroclinic instability; numerical weather prediction; general circulation of the atmosphere. SYNOPTIC METEOROLOGY. Pressure systems; frontal and air mass analysis and forecasting; convection; forecasting of fog, cloud, precipitation, icing and turbulence. PRACTICAL TRAINING. Meteorological observations; basic meteorological instruments; coding and plotting of meteorological reports; analysis of surface and upper-air charts.

There is no student accommodation in the Centre but private accommodation can usually be arranged at student's own expense. Fees (1988) IRE 3,500.

Entry: First or second class honours university degree in physics, mathematical physics or mathematics or university degree in meteorology.

IRL-1-2 Key-words: MET Technician Cl.3 ProfF-Bases 13 weeks Ad hoc English 1988

Course Title: *Training of Meteorological Officers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Meteorological observations; theory and maintenance of basic meteorological instruments; meteorological codes; plotting of surface and upper-air charts and aerological diagrams; elementary theoretical meteorology.

There is no student accommodation in the Centre but private accommodation can usually be arranged at student's own expense. Fees (1988) IRE 2,000.

Entry: Secondary school Leaving Certificate and a pass in a science subject or equivalent.

IRL-1-3 Key-words: MET Observation Cl.4 ProfF-Bases 8 weeks Ad hoc English 1988

Course Title: *Training of Assistant Meteorological Officers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Meteorological observations and codes; use and maintenance of basic meteorological instruments.

There is no student accommodation in the Centre but private accommodation can usually be arranged at student's own expense. Fees (1988) IRE 1,500.

Entry: Completion of relevant formal course or equivalent.

IRL-2 University College, Galway TEL:
 Contact: Laboratory of Atmospheric Science FAX:
 Address: Department of Physics E-M/tlx:
 University College
 GALWAY, Ireland

IRL-2-1 Key-words: GEO Scientific Cl.1b UnivE-Atmos 1 year Annual Irish,E 1988

Course Title: *Atmospheric Physics (4th year science course)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

ELEMENTARY METEOROLOGY: introductory meteorology; general circulation of the atmosphere; cyclones and anticyclones; stability and instability of the atmosphere; clouds; fog; storms. CLOUD PHYSICS: nucleation of liquid water; aerosol physics; nucleation of the ice phase; freezing clouds; non-freezing clouds. SPECIAL TOPICS: weather modification; meteorological optics; radar meteorology; atmospheric electricity; thunderstorm electrification; air pollution; the ionosphere.

Fees - on application.

Entry: Matriculation plus 3 years of B.Sc. Physics programme.

IRL-2-2 Key-words: GEO Scientific Cl. 1a UnivE-Atmos 12 weeks Annual Irish,E 1988

Course Title: *Introduction to the Atmosphere*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

THIRD YEAR SCIENCE MODULE: Introduction to the Atmosphere. Introductory meteorology; weather maps, wind. Basic meteorological instruments and their use. Vertical structure of the atmosphere; the upper atmosphere. Heat budget of the atmosphere. General circulation of the atmosphere. Cyclones and anticyclones; hurricanes tornadoes. Stability and instability of the atmosphere; convection. Clouds and their formation; the microstructure of clouds. Weather forecasting; meteorological satellites. Meteorological optics; rainbows, halos, etc. Thunderstorm electrification; lightning, atmospheric electricity. Marine meteorology; air-sea interaction. Air pollution. Weather and climate modification. Radar meteorology; use of lidar (laser radar) for air pollution studies.

Course is part of broader course for B.Sc. (General) or B.Sc. (Honours) but may be taken separately in some cases. Fees - on application.

Entry: Matriculation and First Year University Physics.

IRL-2-3 Key-words: GEO Scientific Cl. 1c UnivS-ET&R 2-4 years Ad hoc Irish,E 1988

Course Title: *Ph.D. and M.Sc. degree by research*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

RESEARCH AREAS: Cloud Physics. Study of the Marine Atmosphere. Noctilucent clouds. Aerosol Physics. Air Pollution. Environmental Energy Utilization. Other areas by agreement.

Duration: 1 - 2 years for M.Sc.; 3 - 4 years for Ph.D. (usually). Fees - on application.

Entry: Honours degree and acceptance by Faculty of Science.

IRL-3 University College, Galway

TEL:

Contact The Director

FAX.

Address: International Postgraduate Hydrology Courses
Department of Engineering Hydrology
University College, GALWAY, Ireland

E-M/tlx:

IRL-3-1 Key-words: HYD Operational Cl. 1b UnivS-Intl Flexible Biennial English 1988

Course Title: (1) *Postgraduate course in Hydrology*. (2) *M.Sc. in Hydrology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

LECTURES (about 500) in Physical Processes in Hydrology, Hydrology, Hydrometry, Hydraulics of Open Channels, Groundwater Hydraulics, Hydrologic Systems (deterministic and stochastic), Hydrologic Frequency, Applied Hydrology.

DIPLOMA only. Hydrologic Computation, Water Quality Modelling, Quality Modelling, River Mechanics, Geophysics and Hydropower, Irrigation and Drainage, Environmental Studies and Water Quality.

MASTER'S degree. Students, on completion of the lecture course, are required to carry out a project of research or design/analysis before the award of a Master's degree. The project is not a requirement for the award of the Diploma.

The course is provided as part of Ireland's Foreign Aid Programme. The Irish Government provides 20 fellowships for students from certain specified countries. These fellowships cover the costs of transport to and from Ireland, living costs and tuition costs. Suitably qualified students from other countries or financed by other authorities are also welcome. Fees (1988) IRL 1,700 (est).

Entry: Honours University degree in Engineering or suitable Science subjects.

ISRAEL, The State of

ISR-1	Regional Meteorological Training Centre, Bet-Dagan, Israel	TEL:	(972-3) 968-2165
Contact	Regional Meteorological Training Centre	FAX:	(972-3) 968-2126
Address:	Israel Meteorological Service, Study Centre at Avia Hotel P.O. Box 25 BET-DAGAN 50250, Israel	E-Mail:	972-381.466

ISR-1-1 Key-words: MET Operational Cl. 1b ProfF-Agric 6 weeks Annual English 1995

Course Title: *Basic Agricultural Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Agricultural meteorology. Physical climatology. Heat balance of the soil. Water and the hydrological cycle. Influence of topography, surface and soil characteristics upon the properties of the lowest part of the atmosphere. Topoclimate (or mesoclimate). Microclimate. Influence of management practices and treatments upon microclimate. Weather hazards adversely affecting agricultural output. Operational agrometeorology.

OBJECTIVE of the course: to train professional personnel in the interdisciplinary sciences of agrometeorology; the application of climatic data and information to biological and physiological processes.

Entry: Applicants must have a B.Sc. degree in physical/mathematical sciences or in agricultural sciences, meteorology or geography. In addition, participants should have at least three years of practical experience.

ISR-1-2 Key-words: MET Scientific Cl. 1b ProfF-Agric 4 weeks Annual English 1995

Course Title: *Crop-Weather Modelling*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction. Meteorological and biological data sets. Climate requirements of crops. Crop-growth simulation models. Crop-weather analysis models. Empirical statistical models. Case studies.

OBJECTIVE of the course: to provide the participants with basic and updated knowledge on the principles of agrometeorological models; to enhance the capabilities of participants in the application, modification, and management of agrometeorological models, especially for cereals; to provide venue for discussion on new developments in crop simulation and for the exchange of experiences among participants and professional personnel.

Entry: Applicants must have an M.Sc. degree in physical/mathematical sciences or in agricultural biological sciences. In addition, participants should have at least three years of practical experience.

ISR-1-3 Key-words: HYD Operational Cl. 1b ProfS-Rfrsh 4 weeks Annual English 1995

Course Title: *Hydro-Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction. The measurement of hydro-meteorological elements. The analysis of hydrometeorological elements. The presentation of water balances. Water resources assessment and management. Case studies.

OBJECTIVE of the course: to present a multidisciplinary approach to the assessment planning and rational management of water resources; hydrological processes are considered in inter-relationship with the environment and human activities; the multipurpose resources to meet the need of economic and social development is stressed.

Entry: Applicants must have a B.Sc. degree in hydrology, meteorology or physical/mathematical sciences. In addition, participants should have at least three years of practical experience.

ISR-1-4 Key-words: MET Operational Cl. 1b ProfF-Hydro 4 weeks Annual English 1995

Course Title: *Data Base Construction, Maintenance and Management*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction. The measurement of meteorological elements. The analysis of meteorological elements. Methods of data verification. Construction of data series. Management of data bank.

OBJECTIVE of the course: to provide the participants with basic and updated knowledge on the principles of the collection, verification, quality control storage, availability and recovery of climatological data; to

provide venue for discussion on new developments in data management and for the exchange of experiences among participants and professional personnel.

Entry: Applicants must have a B.Sc. degree in Climatology, Meteorology or Statistics. In addition, participants should have at least three years of practical experience.

ISR-2	Hebrew University of Jerusalem	TEL:	(972-3) 968-2116
Contact	Department of Atmospheric Sciences	FAX:	
Address:	The Hebrew University of Jerusalem	E-M/tlx:	381466
	JERUSALEM		
	Israel		

ISR-2-1 Key-words: MET Scientific Cl. 1a-1c UnivF-ET&R 3-4 years Annual Hebrew 1995

Course Title: *Graduate and undergraduate programmes in atmospheric sciences B.Sc., M.Sc. and Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE PROGRAMME: the Earth as a planet; atmospheric thermodynamics; dynamic meteorology; physical climatology; synoptic meteorology; methods of measurements and observations; optics and radiation in the atmosphere; meteorological aspects of air pollution; cloud and rain physics; physical weather prediction; fluid dynamics and the atmospheric boundary layer; measurements systems in meteorology; physics of the upper atmosphere and of the interplanetary space; micrometeorology; numerical weather prediction; physical meteorology; general and regional climatology.

GRADUATE PROGRAMME: aerosol science; interspatial transport processes; air pollution by gases and particulates; phase transition of nucleation; radiative transfer and selected problem in planetary atmospheres; clouds physics and dynamics; atmospheric ozone; atmospheric electricity; numerical studies of the general circulation meso- and macro-scales; remote sensing and light scattering problems; aerosol transport mechanics in clouds and polluted atmospheres; gaseous pollution in urban areas; scientific problems in the Israel Enhances Rain Experiment.

Entry: Completion of high school education for the undergraduate studies and of an undergraduate programme for the graduate studies.

ISR-2-2 Key-words: MET AssistForec Cl 2 ProfS-Synop 3 months Biennial Hebrew 1995

Course Title: *Training for assistant forecasters*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Physical meteorology; dynamic meteorology; numerical weather prediction; thermodynamics; meteorological instruments; observation and codes; synoptic meteorology; general and regional climatology; general and regional synoptic climatology.

Entry: Completion of undergraduate studies in meteorology or physics or related areas. In some cases, completion of high school education.

ISR-3	Tel-Aviv University	TEL:	
Contact	Department of Geophysics and Planetary Sciences	FAX:	
Address:	Tel-Aviv University	E-M/tlx:	
	Ramat-Aviv		
	TEL-AVIV, Israel		

ISR-3-1 Key-words: GEO Scientific Cl. 1a-1c UnivF-ET&R 3-4 years Annual Hebrew,E 1995

Course Title: *B.Sc., M.Sc., Ph.D. Programmes in geophysics and atmospheric sciences*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE PROGRAMME: basic concepts in geophysics and in atmospheric sciences; mathematical methods in geophysics; introduction to physics of the Earth and solar system; chemistry of planetary atmospheres; sources of energy of the atmosphere; introduction to dynamic meteorology and numerical forecasting; introduction to oceanography; introduction to the theory of climate; atmospheric thermodynamics; laboratory in atmospheric sciences.

GRADUATE PROGRAMME: introduction to Earth and planetary sciences; introduction to atmospheric sciences; introduction to planetary ionosphere and magnetospheres; approximation methods in geophysics and planetary sciences; radiative transfer; dynamics and physics of the upper atmosphere; cloud physics; numerical methods of weather prediction; climate models; magnetohydrodynamics; plasma in solar system; solid bodies in solar system; origin of life and the chemistry of planetary atmospheres; formation of the solar system measurement techniques for particles and fields in space; remote-sensing techniques

and applications; hydrodynamics; general and physical oceanography.

Language of courses: Most courses are in Hebrew; occasionally, in English.

Entry: Completion of high school (matriculation), for the undergraduate programme; and undergraduate studies for the graduate programme.

ISR-3-2 Key-words: MET Clhymet Cl. 1a UnivE-Geogr 1-2 semeste Annual Hebrew 1995

Course Title: *Graduate and undergraduate programmes in geography and meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE STUDIES: introduction to climatology; meteorological instruments and observations; synoptic meteorology; the climate of the Mediterranean; the climate of Israel; climatic factor in planning and building; human beings in their climatic environment; topics in climatology and environment (two seminars).

GRADUATE STUDIES: physical climatology; dynamical microclimatology; urban climatology; human being and climate; building climatology and the use of natural energies; siting of industrial plants and other pollution sources and monitoring their environment; preparing environment impact statements; practical work in the Meteorological Service; studying the various pollution sources.

Entry: (1) Matriculation, or the equivalent, for undergraduate studies;

(2) Undergraduate studies for graduate studies.

ISR-4 Bar-Ilan University, Ramat-Gan, Israel

TEL:

Contact The Department of Geography

FAX:

Address: Bar-Ilan University
RAMAT-GAN
Israel

E-M/tlx:

ISR-4-1 Key-words: ENV Operational Cl. 1a-1c UnivE-Clima 2 semesters Annual Hebrew,E 1995

Course Title: *Graduate and undergraduate programmes in geography with specialization in climate and weather*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Climatology and basic meteorology; climatology of Israel; introduction to oceanography; applied climatology; intermediate meteorology; dynamic intermediate meteorology; weather forecasting; meteorology of air quality; urban climatology; micrometeorology; tropical meteorology; selected problems in synoptic meteorology; selected problems in the climatology of Israel; advanced dynamic meteorology.

Language of courses: most courses are in Hebrew; occasionally, courses are given in English.

Entry: Matriculation, for the undergraduate programme; and completion of undergraduate studies for the graduate programme.

ISR-5 Ben Gurion University of the Negev

TEL:

Contact Department of Geography

FAX:

Address: Ben Gurion University of the Negev
P.O. Box 2053
BEER SHEVA, Israel

E-M/tlx:

ISR-5-1 Key-words: ENV Operational Cl. 1a UnivE-Geogr 1-2 semeste Annual Hebrew 1995

Course Title: *Courses for students in natural sciences*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction to meteorology; regional climatology; the climate of Israel. Lectures; training exercises; laboratory work; seminar work; research meteorology for students in both natural sciences and humanities.

Entry: Basic knowledge of mathematics, physics and chemistry.

ISR-6 Israel Institute of Technology, Haifa

TEL:

Contact Environmental Engineering

FAX:

Address: Technion, Israel Institute of Technology
HAIFA
Israel

E-M/tlx:

ISR--6--1 Key-words: MET Clhymet Cl. 1b ProfS-Pollu 1 semester Annual Hebrew 1995

Course Title: *Meteorological aspects of air pollution*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Meteorological aspects of air pollution.

Entry: Completion of high school education.

ISR--7 Hebrew University of Jerusalem

TEL:

Contact Physical Geography Section

FAX:

Address: Earth Science Institute
Hebrew University of Jerusalem
91904 JERUSALEM, Israel

E-M/tlx:

ISR--7--1 Key-words: MoH Clhymet Cl. 1b UnivS-Clima 2 years Annual Hebrew 1995

Course Title: *Graduate courses in climatology and hydrometeorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Advanced statistical methods; synoptic climatology; seminar in hydrometeorology; field course; physical geography.

Entry. B.Sc. in meteorology or physical geography.

ISR--8 Hebrew University of Jerusalem

TEL:

Contact Department of Soil and Water Sciences

FAX:

Address: Fac. of Agriculture, Hebrew Univ. of Jerusalem
P.O. Box 12, Rehovot 76-100,
JERUSALEM, Israel

E-M/tlx:

ISR--8--1 Key-words: MET Clhymet Cl. 1a UnivE-Agric 1 semester Annual Hebrew 1995

Course Title: *Courses in agrometeorology and micrometeorological processes*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE Course: Agrometeorology and fundamentals in meteorology.

GRADUATE Course: Micrometeorological processes.

Entry: Completion of high school education.

ITALY; The Italian Republic

ITA--1 **Institute of Agrometeorology and Environmental
Analysis for Agriculture , IATA Firenze**

TEL: (39-55) 30 15 04

Contact Prof. G. Maracchi, Istituto per l'Agrometeorologia e
Address: l'Analisi Ambientale Applicata all'Agricoltura, I.A.T.A.
 Piazzale delle Cascine, 18
 Firenze, Italy

FAX: (39-55) 30 89 10

E-M/tlx: marachi@sunsever.iata.fi.Cnr.it

ITA--1-1 Key-words: MET Scientific Cl. 1b ProfS-Agric 2 weeks Ad hoc English, F 1996

Course Title: *Computing and Remote Sensing Applications to Agrometeorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

- Crop agrometeorological modelling
- Pest and diseases modelling
- Agroclimatic classification
- Remote sensing techniques for agroclimatology
- Database and processing for agroclimatology

Entry: University degree in scientific subject(s).

JPN-1 Meteorological College, Kashiwa (MCK)

Contact: Head Office of International Affairs
Address: Planning Division

Japan Meteorological Agency (JMA)
1-3-4 Otemachi, Chiyoda-ku, TOKYO, Japan

TEL: (81-3) 3211-4966

FAX: (81-3) 3211-2032

E-Mail: inad-jma@hq.kishou.go.jp

JPN-1-2 Key-words: MET Operational Cl.1b ProfF-Bases 60 days Annual Japanese 1998

Course Title: *Basic Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Atmospheric Physics; Dynamic Meteorology; Outline of Weather Forecasting; Oceanography; Seismology; Instruments and Observations; Experiment of Geophysical Fluid; Information Processing System.

No foreign students are accepted. No fees.

Entry: 2 years' experience in JMA.

JPN-1-3 Key-words: MET Operational Cl.1b-2 ProfF-Telec 40 days Annual Japanese 1998

Course Title: *Information Processing*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Telecommunication System; Computer Programming; System Management and Operation.

No foreign students are accepted. No fees.

Entry: More than 1 year's experience in the relevant field.

JPN-1-4 Key-words: MET Operational Cl.1b-2 ProfF-Instr 40 days Annual Japanese 1998

Course Title: *Instruments of Observation - Surface*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Electronics; Practical Electronics; Instrumentation and Observation; Statistics; Management; Relevant Regulations..

No foreign students are accepted. No fees.

Entry: More than 1 year's experience in the relevant field.

JPN-1-5 Key-words: MET Operational Cl.1b-2 ProfF-Instr 40 days Annual Japanese 1998

Course Title: *Instruments of Observation - Upper Air*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Electronics; Practical Electronics; Instrumentation and Observation; Aerology; Radiosonde; Ozone Observation; Relevant Regulations.

No foreign students are accepted. No fees.

Entry: More than 1 year's experience in the relevant field.

JPN-1-6 Key-words: MET Operational Cl.1b-2 ProfF-Instr 40 days Annual Japanese 1998

Course Title: *Instruments of Observation - Radar*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Electronics; Practical Electronics; Instrumentation and Observation; Radar Meteorology; Radar Engineering; Doppler Radar; Relevant Regulations.

No foreign students are accepted. No fees.

Entry: More than 1 year's experience in the relevant field.

JPN-1-7 Key-words: MET Operational Cl.1b-2 ProfF-Marin 40 days Annual Japanese 1998

Course Title: *Marine Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Physical, Chemical and Biological Oceanography; Maritime Meteorology; Climate Change; Remote Sensing.

No foreign students are accepted. No fees.

Entry: More than 3 years' experience in the relevant field.

JPN-1-8 Key-words: MET Operational Cl. 1b-2 ProfF-ETR&D 50 days Annual Japanese 1998

Course Title: *Weather Forecasting*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation fees, etc.):

Dynamical Meteorology; Numerical Weather Prediction; Weather Analysis; Radar Meteorology; Satellite Meteorology; Disaster Prevention; Aviation Meteorology; General Circulation and Disturbances.

Foreign students are in principle not accepted. No fees.

Entry: Half a year - 3 years' experience in forecasting.

JPN-1-9 Key-words: MET Operational Cl. 1b-2 ProfS-Forec 25 days Annual Japanese 1998

Course Title: *Advanced Forecasting*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation fees, etc.):

Numerical Weather Prediction; Synoptic Weather Analysis; Radar Meteorology; Satellite Meteorology; Disaster Prevention.

No foreign students are accepted. No fees.

Entry: More than 5 years' experience in forecasting.

JPN-1-10 Key-words: MET Operational Cl. 2 ProfS-DataP 50 days Annual Japanese 1998

Course Title: *Advanced forecaster course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation fees, etc.):

Meteorological Information; System Analysis; System Design; Information Processing Technique; Network Technique; Mangement of Operation; System Inspection

No foreign students are accepted. No fees.

Entry: High School Grraduate and more than 1 year's experience in the relevant field.

JPN-1-11 Key-words: MET Operational Cl. 2 ProfS-Advan 60 days Annual Japanese 1998

Course Title: *Meso-Scale Forecasting*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation fees, etc.):

Meso-Meteorology; Radar Meteorology; Satellite Meteorology; Weather Analysis; Numerical Weather Prediction; Computer Programming; Disaster Prevention.

Foreign students are in principle not accepted. No fees.

Entry: High School Grraduate and more than 1 year's experience in the relevant field.

JORDAN, The Hashemit Kingdom of

JOR-1	Meteorological Training Centre, Amman	TEL:	(962-6) 892 408
Contact	Jordanian Meteorological Department	FAX:	(962-6) 894 409
Address:	Amman Civil Airport	E-Mail:	219.08 METAM JO
	AMMAN, Jordan		

JOR-1-1 Key-words: MET Observation Cl. 3-4 ProfF-Bases 6 months Annual Arabic,E 1995

Course Title: *Observation course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Elementary Meteorology and Climatology; Meteorological Instruments; Synoptic Codes; Making and Recording of Weather Observations; Decoding and Plotting; Calculation of Pilot Balloon Data.

The Meteorological Training Centre offers ad hoc training as necessary: on-the-job training for observers and professional forecasters. Fees for the foreign students - to be determined by the Director General.

Entry: Secondary School Certificate.

JOR-1-2 Key-words: MET PredictForec Cl. 1b-2 ProfF-Bases 9 months Annual Arabic,E 1995

Course Title: *Forecasting course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Basic Meteorology; Dynamic Meteorology; Thermodynamics of the Atmosphere; Synoptic Meteorology, and Weather Analysis and Forecasting; Aeronautical Meteorology.

The Meteorological Training Centre offers ad hoc training as necessary: on-the-job training for radiosonding operators. Fees for the foreign students - to be determined by the Director-General

Entry: B.Sc. in physics, mathematics or computer science

JOR-2	Queen Noor College for Civil Aviation, Amman	TEL:	(9626) 892 484
Contact	Queen Noor College for Civil Aviation	FAX:	(9626) 894-409
Address:	Amman Civil Airport	E-Mail:	WEATHER AMMAN
	AMMAN, Jordan		

JOR-2-1 Key-words: MET Observation Cl. 3 ProfE-Synop 2 years Annual English 1995

Course Title: *General Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General Meteorology; Synoptic Meteorology; Dynamic Meteorology; Marine Meteorology; Instruments; Thermodynamics; Air Pollution Meteorology; Climatology; Plotting; Methods of Observation; Meteorological Codes.

Entry: High school graduate, scientific.

KENYA, The Republic of

KEN-1	Institute for Meteorological Training and Research, Nairobi	TEL:	(254-2) 567-880				
Contact	The Principal	FAX:	(254-2) 567-889				
Address:	Institute for Meteorological Training and Research P.O. Box 30259 NAIROBI, Kenya	E-Mail:	222.08 WEATHER				
KEN-1-1	Key-words: MET Observation Cl.4	ProfF-Bases	4 months	Ad hoc	English	1988	
Course Title: <i>Basic observers course</i>							
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):							
General meteorology; meteorological elements; pilot balloon work; meteorological coding and decoding; plotting of synoptic charts, tephigrams, meteograms; meteorological instruments; preparation of climatological returns; organization and administration procedures; agrometeorology; methods of collecting and disseminating observations.							
Fees (1988) KSh 2,420 for members of IGC.							
Entry: Secondary education; equivalent to the General Certificate of Education (GCE) 'O' level with credits in mathematics and physics.							
KEN-1-2	Key-words: MET Technician Cl.3	ProfS-Rfrsh	12 months	Annual	English	1988	
Course Title: <i>Advanced observers course / Advanced technicians course</i>							
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):							
Mathematics; physics; general meteorology; meteorological instruments and methods of observation; climatology and data-processing agrometeorology; elementary synoptic analysis; hydrometeorology.							
This course is intended for senior technicians and WMO Class IV meteorologists who have several years' experience in weather observations and other related duties. Fees (1988) KSh 6,960 for members of IGC; KSh 20,875 for non-members.							
Entry: Secondary education equivalent to the General Certificate of Education (GCE). Two years' experience in meteorological work. Passed a course for Class IV meteorological personnel.							
KEN-1-3	Key-words: MET PredictForec Cl.2	ProfE-Aeron	1-2 years	Ad hoc	English	1988	
Course Title: <i>Initial forecasters course</i>							
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):							
Two types of courses are offered, which differ mainly in the entrance qualifications of the candidate. COURSE (a): FIRST YEAR: mathematics; physics; introductory meteorology. SECOND YEAR: dynamic meteorology; synoptic meteorology; aeronautical meteorology and international procedures; atmospheric thermodynamics; physical meteorology; meteorological instruments; agricultural meteorology; hydrometeorology; meteorological statistics, climatology and data processing; weather analysis and forecasting; simulated on-the-job training; project work.							
COURSE (b): same as second year of course (a).							
This course provides basic training of Class II meteorological personnel with specialization in aeronautical forecasting. Duration: course (a): 2 years; course (b): 1 year. Fees (1988) KSh 6,960 (per year) for members of IGC; KSh 20,875 (per year) for non-members.							
Entry: Course (a): Secondary education equivalent to GCE 'O' level. Previous training as meteorological observer is also required. Course (b): Secondary education equivalent to GCE 'A' level.							
KEN-1-4	Key-words: MET PredictForec Cl.2	ProfS-Rfrsh	10 weeks	Ad hoc	English	1988	
Course Title: <i>Advanced forecasters course (Class II)</i>							
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):							
Surface charts; tephigram; cloud physics; development; satellite meteorology; forecast issue; diurnal variations; diurnal systems; rainfall; climatology; special topics (radar meteorology, lee waves, talks by students).							
This course is offered to practising meteorological forecasters and it is designed to refresh the forecaster on the basic principles as well as to update his or her knowledge of the latest developments in the art of weather forecasting. Fees (1988) KSh 1,420 for members of IGC; KSh 4,250 for non-members.							

Entry: Satisfactory completion of Class II initial forecasters course and at least two years' experience in forecasting work.

KEN-1-5 Key-words: MET PredictForec Cl. 1b ProfS-Rfrsh 20 weeks Annual English 1988

Course Title: *Operational training course (Class I)*

Course Syllabus and Additional Information (c.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Aeronautical meteorology; marine meteorology; surface charts; tephigram; upper-air charts; development; satellite meteorology; forecast issue; diurnal systems; climatology; cloud physics; special topics.

This course is mainly intended for Class I meteorology graduates from the University of Nairobi as a complement to their theoretical training so that they may become independent forecasters of a main analysis centre in the shortest time possible. Fees (1988) KSh 2,835 for members of IGC; KSh 8,500 for non-members.

Entry: B.Sc. degree in meteorology or Postgraduate Diploma course in meteorology.

KEN-1-6 Key-words: MET Clhymet Cl. 1b-2 ProfS-Agric 6 months Annual English 1988

Course Title: *Specialized course in agrometeorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Review of biological principles, agronomic principles, agrometeorological observations, principles of both animal and crop production, agrometeorological assessment of both thermal and moisture resources, applied statistics, micrometeorology, agrometeorological modelling, agrometeorological activities within meteorological services, project work.

This course is offered to Class I and Class II meteorological personnel who wish to specialize in agrometeorological work. Trainees with B.Sc. degrees in agriculture may also take this course after completing about 100 hours of general meteorology which will be taken during the six-month period of the course, in lieu of the general biology and agronomy lectures. Fees (1988) KSh 3,670 for members of IGC; KSh 11,000 for non-members.

Entry: Completion of a Class II initial forecasters course, Class I, or completion of a B.Sc. in agriculture.

KEN-1-7 Key-words: MoH Clhymet Cl. 1b-2 ProfS-HyMet 6 months Annual English 1988

Course Title: *Specialized course in hydrometeorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Rainfall: measurement, space-time characteristics, design application of rainfall data; evaporation and evapotranspiration; definitions, nature of processes; ground water; streamflow: measurement, runoff, streamflow analysis; open channel flow dynamics and channel processes; hydrological forecasting; water resources planning and development; project work.

This course is offered to Class I and II meteorological personnel who wish to specialize in hydrometeorological work. Fees (1988) KSh 3,670 for members of IGC; KSh 11,000 for non-members.

Entry: Completion of Class I or Class II initial forecasters course.

KEN-2 **University of Nairobi**
 Contact The Registrar
 Address: Department of Meteorology
 University of Nairobi
 P.O. Box 30197, NAIROBI, Kenya

TEL:
 FAX:
 E-Mail:

KEN-2-1 Key-words: MET Operational Cl. 1a UnivF-Bases 3 years Annual English 1988

Course Title: *B.Sc. degree course in meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

FIRST YEAR: pure mathematics; applied mathematics and statistics; physics.

SECOND YEAR: pure mathematics.

THIRD YEAR: (wholly devoted to meteorology). Meteorological instruments and methods of observation. Physical meteorology I; radiation in the atmosphere and atmospheric optics. Physical meteorology II; statics and thermodynamics of the atmosphere. Cloud physics; microphysics of cloud formation and precipitation processes, atmospheric electricity. Dynamics of atmospheric motions I; formation and discussion of the basic equation of motion. Dynamic of atmospheric motions II; fundamental kinematics of fluid flow, circulation and vorticity theorems, basis for numerical weather prediction. Micrometeorology;

role of the boundary layer in the transport of properties with special reference to the role of the tropics. Synoptic meteorology; introduction to the analysis and appreciation of current weather and to the prediction of selected meteorological elements. Physical and general climatology; climatological elements and their distribution with special reference to Africa. Basic statistical treatment of climatological data; application of statistics to problems of meteorology and climatology. Tropical meteorology, hydrology and agrometeorology and their application in tropical Africa. Some aspects of atmospheric chemistry and air pollution problems. Project work.

Applications for admission should be submitted before the end of November of the previous year. Fees (1988) KSh 36,000 per year.

Entry: School certificate or General Certificate of Education (GCE), with passes in five approved subjects, obtained prior to the sitting of the Higher school certificate or Advanced level of GCE.

KEN-2-2 Key-words: MET Clhymet Cl. 1a UnivE-Intro 1 year Annual English 1988

Course Title: *Atmospheric science course for non-meteorology students*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Atmospheric Science programme: meteorological instruments and observational methods; physical atmospheric motion systems.

Applications for admission should be submitted before the end of November of the previous year. Fees (1988) KSh 36,000 per year.

Entry: Higher School Certificate or Advanced level of the General Certificate of Education. Class II meteorologists with at least a Credit pass admitted.

KEN-2-3 Key-words: MET Scientific Cl. 1c UnivS-ET&R 2-3 years Ad hoc English 1988

Course Title: *M.Sc. and Ph.D. degrees in meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

YEAR I M.Sc. degree programme in meteorology (four out of the following six courses; the first two courses are compulsory for all students). Dynamic meteorology and general circulation; synoptic meteorology and climatology; atmospheric physics; cloud physics and weather modification; agrometeorology; hydrometeorology; pollution.

YEAR II M.Sc. one year research on an approved subject on successful completion of year 1, results of which are embodied in a thesis.

Ph.D. only research work on a research subject approved by the Department and the Faculty postgraduate committee.

Duration: M.Sc. degree a minimum of two academic years (or 18 months). Ph.D.: three years full time and maximum of five years for part time. Starting date: M.Sc., September. Applications for admission should be submitted before the end of November of the previous year. Ph.D., any month. Fees (1988) KSh 34,000 per year.

Entry: M.Sc. degree: normally, B.Sc. degree in meteorology or an appropriate B.Sc. degree followed by the Postgraduate diploma in meteorology. For Ph.D.: M.Sc. in meteorology or its equivalent.

KEN-2-4 Key-words: MET Operational Cl. 1c UnivS-Atmos 1 year Ad hoc English 1988

Course Title: *Postgraduate Diploma course in meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The course provides the basic knowledge required for further advanced studies leading to M.Sc. and Ph.D. degrees in meteorology. The ground covered in meteorology is equivalent to that offered in the B.Sc. programme, and the teaching will actually be carried out parallel to the B.Sc. degree third-year course. A fourth term of about 4 weeks is devoted to continued guided project work in meteorology.

The purpose of this course is to offer a fundamental meteorological education required for the Class I meteorological personnel. Applications for admission should be submitted before the end of November of the previous year. Fees (1988) KSh 36,000 per year.

Entry: B.Sc. degree in mathematics and/or physics, mathematics and chemistry, physics and chemistry.

KEN-3 Kenya Water Institute
Contact: The Principal
Address: The Kenya Water Institute
P.O. Box 60013
NAIROBI, Kenya

TEL: (254-2) 505 838

FAX:

E-M/tlx:

Course Title: *Surface Water Technology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

FIRST YEAR: Hydrology: definition, hydrologic cycle, basic concepts; Rainfall: measurement, siting and installation errors; Evaporation: factors affecting evaporation, measurement; Infiltration: infiltration capacity and rate; Measurement, catchment area: delineation and measurement; Streamflow: classification of streams, velocity measurement; Water levels: measurement and conversion to discharge; Hydrographs: flood hydrographs, components.

SECOND YEAR: Surface runoff: volume and duration, flow duration curves; Unit hydrograph: base flow separation, unit hydrograph from a simple storm; Hydrometric networks: minimum and optimum networks; Water balance: water balance equation, boundary conditions; Flood peak estimation: factor of safety method; Water levels: datums, automatic water level recorders; Hydrological data: data collection, processing, editing, etc.; Basic meteorology: the atmosphere, atmospheric stability; Clouds: evaporation, rainfall; Solar radiation; The ITCZ.

THIRD YEAR: Frequency analysis statistical distributions; Flood forecasting: empirical methods, rainfall methods; Sedimentation: erosion processes, sediment transport; Reservoir operations: types of reservoirs, storage zones; Hydrologic models: types, calibration and verification; Uses of data; water supplies, dam design, flood estimation, project work.

Foreign students must first obtain clearance from their own Governments and the Government of Kenya. Students are accommodated in hostels. Fees (1988) US\$ 160 per term of three months.

Entry: Kenya Certificate of Education. 'O' level, credits in English, mathematics, and physical science or physics and chemistry done separately.

KOREA, The Republic of

KOR-1 Meteorological Training Institute, Seoul
 Contact Meteorological Training Institute
 Address: Korea Meteorological Administration (KMA)
 1 Songwol-dong, Chongno-gu
 SEOUL 110-101, Korea

TEL: (82-2) 730-6911
 FAX: (82-2) 730-6911
 E-M/tlx: KMSSEL K272.76

KOR-1-1 Key-words: MET Observation Cl.4 ProfF-Ablni 3 weeks Ad hoc Korean 1995

Course Title: *On-the-job training course for recruiting personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction to meteorology; Telecommunication system of meteorological data; Meteorological Service Law of Korea; International cooperation in meteorology; Meteorology for life of the Public.

Maximum accommodation 60. No tuition fees.

Entry: Candidates for Class IV meteorologist who passed the entrance examination to the KMA, but still waiting for formal appointment.

KOR-1-2 Key-words: MET Observation Cl.3 ProfF-Bases 6 weeks Ad hoc Korean 1995

Course Title: *On-the-job training course for recruit personnel undergone KOR-1-1 Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Agrometeorology; Meteorological Instruments; Marine Meteorology; Meteorological Statistics; Aeronautical Meteorology; Image analysis of meteorological satellites; Earthquake observation; Data analysis of meteorological radar; Weather Observation; Meteorological telecommunication; Weather chart analysis; Introduction of Numerical Weather Prediction; Meteorological data-processing system; Structure of the Earth and its Atmosphere; Atmospheric radiation and climate; Dynamic Meteorology; Cloud Physics and mesoscale movement; Automatic Weather System (AWS).

Practice of description of weather chart, weather observation; coding and decoding of synoptic observation data; AWS data logger; AWS repair. No tuition fees.

Entry: Recruited personnel who have completed the KOR-1-1 Course.

KOR-1-3 Key-words: MET Scientific Cl.1b ProfF-Rsrch 1 week Ad hoc Korean 1995

Course Title: *Course on Theoretical Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Structure of the Earth and its Atmosphere; Atmospheric radiation and climate; Dynamic Meteorology; Cloud physics and mesoscale movement.

Begun in 1994. Maximum accommodation 30. No tuition fees.

Entry: Class I meteorologists and meteorological researchers of the KMA.

KOR-1-4 Key-words: MET PredictForec Cl.2 ProfF-OJT 2 weeks Annual Korean 1995

Course Title: *On-the-job training course for Class II meteorologist*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Weather analysis and forecasting; Introduction to numerical weather forecasting; General Meteorology; Climatology.

Maximum accommodation 25. No tuition fees.

Entry: Class II meteorologists and meteorological researchers in KMA who have no experience.

KOR-1-5 Key-words: MET Operational Cl.2 ProfF-Elect 1 week Annual Korean 1995

Course Title: *Course on Automatic Weather System (AWS)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Structure of Automatic Weather System (AWS); Data collection and transmission of AWS; Repair of AWS; Practice of data logger, structure and repair of AWS.

No tuition fees.

Entry: Class II telecommunication operators and electronic engineers of the KMA.

KOR--1-6 Key-words: MET Operational Cl.3 ProfF-DataP 1 week Annual Korean 1995

Course Title: *Computer training course for elementary class personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

MS-DOS; Meteorological data and telecommunication; Meteorological data processing; System of meteorological information and data analysis.

Maximum accommodation 25. No tuition fees.

Entry: Class III meteorological personnel and electronic engineers of the KMA.

KOR--1-7 Key-words: MET InstrumEquip Cl.2 ProfF-DataP 1 week Annual Korean 1995

Course Title: *Computer training course for technical personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Electronic statistics; Meteorological data base system of the KMA; UNIX; Data Base Management System (DBMS).

Maximum accommodation 25; There are 30 PCs in the Meteorological Training Institute. No tuition fees.

Entry: Technical class of meteorologists and electronic engineers of KMA.

KOR--1-8 Key-words: MET Clhymet Cl.4 ProfF-Aeron 1 week Annual Korean 1995

Course Title: *Course on Aeronautical Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introductory Aeronautical Meteorology; Aeronautical Weather Forecast; Observation of Aeronautical Meteorology; Aeronautical Meteorological Support; Meteorology and Aircraft Support; System of Aero-Telecommunication; Meteorology for Life of the Public.

Begun in 1994. No tuition fees.

Entry: Meteorologists of aeronautical meteorological stations; Pilots and air traffic controllers at the aerodromes.

KOR--1-9 Key-words: MET Clhymet Cl.4 ProfF-Bases 3 days Annual Korean 1995

Course Title: *Course for Science Teachers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Meteorological observation; General Meteorology; Climatology; Meteorological radar and satellite; Earthquake observation; Weather forecast; Meteorology and computer; Meteorology for life of the public; Case study on meteorological education of the foreign countries.

Maximum accommodation approximately 300. No tuition fees.

Entry: Science teachers in elementary, middle and high schools who are a little acquainted with meteorology.

KOR--1-10 Key-words: MET Clhymet Cl.4 ProfF-Marin 1 week Annual Korean 1995

Course Title: *Course on Marine Meteorology for the government official*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Marine Meteorology; General Meteorology; Weather observation; Weather analysis and forecast; Meteorological Telecommunication; Meteorology for life of the public; Safety and supervision to marine traffics.

Begun in 1994. No tuition fees.

Entry: Government officials in charge of marine meteorology.

KOR--1-11 Key-words: MET Clhymet Cl.4 ProfF-Marin 3 days Annual Korean 1995

Course Title: *Course on Marine Meteorology for marine workers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Marine Meteorology; Weather observation; Weather analysis and forecast; Safety and supervision to marine traffic.

Begun in 1994. No tuition fees.

Entry: Mariners, shipping stockers, shipping servers.

KOR-1-12 Key-words: MET Clhymet Cl. 4 ProfF-Bases 1 week Trimest Korean 1995

Course Title: *Course on Disaster Prevention Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General Meteorology; Meteorological Instruments; Meteorological Statistics; Weather Observation; Meteorological Telecommunication; Disaster prevention and preparedness system; Meteorology for life of the public; Safety and supervision of marine traffics.

Maximum accommodation 70. No tuition fees.

Entry: Government officials in charge of Disaster Prevention Preparedness.

KOR-1-13 Key-words: MET Clhymet Cl. 4 ProfF-Bases 1 week Biannual Korean 1995

Course Title: *Course on Agricultural Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General Meteorology; Meteorological Instruments; Agricultural Meteorology; Weather Observation; Meteorological Telecommunication; Meteorology for life of the public.

Maximum accommodation 70. No tuition fees.

Entry: Government officials in charge of agricultural meteorology.

KOR-1-14 Key-words: MET Clhymet Cl. 4 ProfF-Bases 1 week Annual Korean 1995

Course Title: *Course on Environmental Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General Environmental Meteorology; Greenhouse Gases and Climate Change; Ozone and Ultra-Violet Radiation; Air pollution and its trends; Origin and anti-measure of air pollution; Meteorological Telecommunication; International cooperation to cope with the environmental degradation.

No tuition fees.

Entry: Government officials in charge of environmental meteorology.

KOR-1-15 Key-words: MET Operational Cl. 4 ProfF-Elect 1 week Annual Korean 1995

Course Title: *Course on Automatic Weather System (AWS) for government officials*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Weather observation; Meteorological Instruments; Meteorological statistics; Meteorological telecommunication; Weather analysis and forecasting; Structure of AWS; Data Collection and transmission of AWS.

Begun in 1995. No tuition fees.

Entry: Government officials in charge of AWS operation.

KOR-2 Seoul National University

TEL: (82-2) 886-0101

Contact: Chairman, Department of Atmospheric Sciences

FAX: (82-2) 885-5272

Address: College of Natural Sciences Seoul National University
San 56-1, Shinling Dong, Kwanak-Gu
SEOUL 151-742, Korea

E-Mail: SNUROK K29664

KOR-2-1 Key-words: MET Operational Cl. 1a UnivF-Atmos 4 years Annual Korean 1988

Course Title: *B.Sc. in Atmospheric Sciences*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

YEAR I: Physics; chemistry; earth science; calculus; general meteorology and laboratory.

YEAR II: Meteorological instrumentation and observation; climatology; mechanics; advanced calculus; algebra; differential equations.

YEAR III: Atmospheric thermodynamics; dynamic meteorology; meteorological statistics; fluid dynamics for meteorologists; introduction to hydrometeorology; air pollution meteorology; aeronautical meteorology.

YEAR IV: biometeorology; weather forecasting and practice; the upper atmosphere; marine meteorology; micrometeorology; satellite meteorology; atmospheric chemistry; seminar in atmospheric sciences.

For foreign students, a good knowledge of Korean is preferred but not required. Foreign students admitted to Seoul National University are usually enrolled in the Korean Language Institute for the first

year. Various scholarships and research assistantships are available for qualified students. Seventy (70) students are accepted in the undergraduate course. Tuition fees (1988) about US \$ 1,300 per year.

Entry: Completion of high school is required to enter the undergraduate course.

KOR-2-2 Key-words: MET Scientific Cl. 1c UnivS-ET&R 2-3 years Annual Korean 1988

Course Title: *M.Sc., Ph.D. in Atmospheric Sciences*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

POSTGRADUATE COURSES: Synoptic meteorology; advanced dynamic meteorology; general circulation of the atmosphere; methods in climatology; advanced climatology; atmospheric turbulence and diffusion; micrometeorology; meteorological instrumentation; physics of cloud and precipitation; geophysical fluid dynamics; numerical modelling and prediction; mesoscale meteorology; tropical meteorology; atmospheric radiation; advanced physical meteorology; advanced meteorological statistics; special topics in atmospheric sciences; research in meteorology; research for the master's degree; physics of the upper atmosphere; polar meteorology; air pollution and dispersion; atmospheric chemistry; waves in the atmosphere; applied meteorology; hydrometeorology; air-sea interaction; special topics in synoptic meteorology; special topics in atmospheric turbulence; special topics in applied meteorology; special topics in numerical modelling and prediction; special topics in physical meteorology; special topics in mesoscale meteorology; research in atmospheric sciences; research for the doctoral degree.

For foreign students a good knowledge of Korean is preferred but not required. Foreign students admitted to Seoul National University are usually enrolled in the Korean Language Institute for the first year.

Various scholarships and research assistantships are available for qualified students. Thirty (30) students are accepted in the postgraduate course. Tuition fees (1988) about US \$ 1,300 per year.

Entry: Graduate courses: previous course work in atmospheric sciences is desirable but not essential.

Students with undergraduate degrees in mathematics, physics, chemistry, engineering are encouraged to apply.

KOR-2-3 Key-words: MET Scientific Cl. 1c UnivS-Rsrch 3 years Ad hoc Korean 1988

Course Title: *Ph.D. in Atmospheric Sciences*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

POSTGRADUATE COURSES: Synoptic meteorology; advanced dynamic meteorology; general circulation of the atmosphere; methods in climatology, advanced climatology; atmospheric turbulence and diffusion; micrometeorology; meteorological instrumentation; physics of cloud and precipitation; geophysical fluid dynamics; numerical modelling and prediction; mesoscale meteorology; tropical meteorology; atmospheric radiation; advanced physical meteorology; advanced meteorological statistics; special topics in atmospheric sciences; research in meteorology; research for the master's degree; physics of the upper atmosphere; polar meteorology; air pollution and dispersion; atmospheric chemistry; waves in the atmosphere; applied meteorology; hydrometeorology; air-sea interaction; special topics in synoptic meteorology; special topics in atmospheric turbulence; special topics in applied meteorology; special topics in numerical modelling and prediction; special topics in physical meteorology; special topics in mesoscale meteorology; research in atmospheric sciences; research for the doctoral degree.

For the graduate course previous course work in atmospheric sciences is desirable but not essential.

Students with undergraduate degrees in mathematics, physics, chemistry, engineering are encouraged to apply. Various scholarships and research assistantships are available for qualified students. Tuition fees (1988) about US \$ 1,300 per year.

Entry:

KOR-3 Yonsei University

TEL: (82-2) 392-0131

Contact: Head, Department of Astronomy and Meteorology

FAX: (82-2) 392 618

Address: College of Science and Technology

E-Mail:

Yonsei University

Seodaemun-gu, SEOUL 120, Korea

KOR-3-1 Key-words: GEO Operational Cl. 1a UnivF-Bases 8 semesters Annual Korean 1988

Course Title: *B.Sc. in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

YEAR I: Physics; chemistry; earth science; advanced algebra and analytical geometry; elementary calculus.

YEAR II: Advanced calculus; general mechanics; atmospheric sciences; modern physics.

YEAR III: Meteorological instruments and observation; atmospheric physics; atmospheric dynamics;

atmospheric analysis; atmospheric chemistry; planetary boundary layer; satellite meteorology.
YEAR IV: Geophysical fluid dynamics; numerical weather prediction; air pollution meteorology; weather forecasting laboratory; seminar in atmospheric sciences; applied meteorology.
Tuition fees (1988) about US \$ 1,000 per semester.
Entry: Completion of the high school education for the undergraduate course.

KOR-3-2 Key-words: GEO Scientific Cl. 1c UnivS-R&D 4 semesters Ad hoc Korean 1988

Course Title: *M.Sc., Ph.D. in meteorology*
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):
POSTGRADUATE Courses in Meteorology. Atmospheric dynamics; atmospheric physics; meteorological data processing; numerical weather prediction; rotating fluids; general circulation of the atmosphere; atmospheric optics; upper atmosphere; cloud dynamics; directed research in meteorology; planetary boundary layer; atmospheric analysis; general circulation; climate dynamics.
POSTGRADUATE Courses in Civil Engineering. Groundwater and seepage; river morphology; hydrologic analysis and groundwater hydrology; hydrometeorology.
Tuition fees (1988) about US \$ 1,000 per semester.
Entry: B.Sc. degree in natural sciences for M.Sc. degree course and M.Sc. degree in meteorology and related sciences for Ph.D. degree course.

KOR-3-3 Key-words: GEO Scientific Cl. 1c UnivS-Rsrch 6 semesters Ad hoc Korean 1988

Course Title: *Ph.D. in Meteorology*
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):
POSTGRADUATE Courses in Meteorology. Atmospheric dynamics; atmospheric physics; meteorological data processing; numerical weather prediction; rotating fluids; general circulation of the atmosphere; atmospheric optics; upper atmosphere; cloud dynamics; directed research in meteorology; planetary boundary layer; atmospheric analysis; general circulation; climate dynamics.
POSTGRADUATE Courses in Civil Engineering. Groundwater and seepage; river morphology; hydrologic analysis and groundwater hydrology; hydrometeorology.
Tuition fees (1988) about US \$ 1,000 per semester.
Entry: B.Sc. degree in natural sciences for M.Sc. degree course and M.Sc. degree in meteorology and related sciences for Ph.D. degree course.

KUWAIT, The State of

KWT-1	Meteorological Department, Safat	TEL: (965) 431-0838
Contact	Meteorological Department	FAX: (965) 472-7326
Address:	Directorate General of Civil Aviation	E-M/tlx: WEATHER - KUWAIT
	P.O. Box 17 Safat, 13001 SAFAT, Kuwait	

KWT-1-1 Key-words: MET Observation Cl. 4 ProfF-Natnl 2 years Ad hoc Arabic 1995

Course Title: *Meteorological Course for Observers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Elementary theoretical meteorology; Meteorological instruments; Observation; Coding and decoding; Plotting of surface and upper-air charts and tephigrams; Preparation of climatological returns; English language (regarding meteorology). PC Courses: DOS, Excell, Windows; CLICOM.

The course is restricted to Kuwaitis only. Applications from Arab countries should be under bilateral agreements. No fees.

Entry: Secondary Education (High School; Science).

LATVIA, The Republic of

LVA-1	Latvian University; Latvian Agricultural University; Marine Academy	TEL:	(371) 714-4390
Contact	Permanent Representative with WMO	FAX:	(371) 714-5154
Address:	Latvian Hydrometeorological Agency 165 Maskavas Str RIGA LV - 1019, Latvia	E-M/tlx:	16.11.51 SHAR SU

LVA-1-1 Key-words: MET Operational Cl. 1a ProfF-Bases 50-90 hours Annual Latvian 1995

Course Title: *Basic Lectures in: Meteorology; Climatology; Hydrology; Oceanography*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Latvian University: Meteorology and Climatology, 64 hours; Hydrology, 64 hours.

Latvian Agricultural University: Hydrology and Bases of Meteorology: 90 hours.

Marine Academy: Oceanography and Meteorology: 48 hours; Navigation Meteorology, 51 hours.

It should be mentioned that the level of the lectures does not meet entirely the requirements mentioned in WMO Publication No.258. However the Latvian Hydrometeorological Agency has a good relationship with the Faculty of Geography of the Latvian University and young specialists, now are employed at the Agency. They are working in several departments: synoptic, hydrological administration, etc.

Entry: University Admission Conditions.

MALAWI

MWI-1	Malawi Meteorological Department	TEL:	(265) 694 355
Contact	The Chief Meteorologist	FAX:	(265) 694 332
Address:	Malawi Meteorological Department	E-M/tlx:	446.11 weather mi
	P.O. Box 2		
	CHILEKA, Malawi		
MWI-1-1	Key-words: MET Observation Cl.4 ProfF-Bases 12 months Ad hoc English 1988		
Course Title: <i>Basic Training of Class IV Meteorological personnel (Observers and Assistants)</i>			
Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):			
Composition of the atmosphere; elementary theoretical meteorology; observation practices including details of instrument used; coding and decoding of weather messages and reports; pilot balloon observation; special observation, plotting surface and upper air charts; preparation of climatological returns; methods of collecting and disseminating observations; uses of different types of reports; care and maintenance of instruments; office organization.			
The school caters for local requirements only. No tuition fees.			
Entry: Secondary education, Malawi junior certificate of education and Malawi Certificate of education 'O' level with passes in mathematics, physical sciences and English.			

MYS-1 Malaysian Meteorological Service, Selangor Darul Ehsan

Contact: Director-General TEL: (603) 758-7422
 Address: Malaysian Meteorological Service, Jalan Sultan FAX: (603) 755-0964
 46667 Petaling Jaya
 Selangor Darul Ehsan, Malaysia E-Mail: MM@kjc.gov.my

MYS-1-1 Key-words: MET Observation Cl. 4 ProfF-Bases 5 months Ad hoc Malay,E 1998

Course Title: *Basic Course for Meteorological Observers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Entry: General certificate of Education (ordinary) with credit passes in mathematics or physics, or an equivalent qualification.

MYS-1-2 Key-words: MET Observation Cl. 3-4 ProfF-Marin 10 days Ad hoc Malay,E 1998

Course Title: *Basic Course for Marine Observers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Entry: Personnel currently employed by other governmental agencies or private companies and involved in weather observations.

MYS-1-3 Key-words: MET Observation Cl. 3-4 ProfS-Pollu 1 week Annual Malay,E 1998

Course Title: *Training Course on Meteorological Aspects of Air Pollution*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Entry: Meteorological observers currently working in stations which carry out pollution observation.

MYS-1-4 Key-words: MET InstrumEquip Cl. 3-4 ProfF-Instr 3 weeks Annual Malay,E 1998

Course Title: *Basic Meteorological Instrument and Climatology Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Entry: Meteorological observers with six years or more working experience.

MYS-2 Drainage and Irrigation Department, Kuala Lumpur

Contact: Principal, Staff Training Centre TEL: ()
 Address: Drainage and Irrigation Department FAX: ()
 Ampang
 68000 KUALA LUMPUR, Malaysia E-Mail: ()

MYS-2-1 Key-words: HYD InstrumEquip Cl. 2 ProfS-Instr 10 days Biannual Malay 1995

Course Title: *Hydrological instruments, observations and data collection*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Entry: Technical assistants, technicians or engineers engaged full time in hydrological works.

MALDIVES, The Republic of

MDV-1 National Meteorological Centre, Maldives

TEL: (960) 323 303

Contact Department of Meteorology

FAX: (960) 323 084

Address: Ghazee Building

MALE, 20-05

E-M/tlx:

Republic of Maldives

MDV-1-1 Key-words: MET Observation Cl.4 ProfE-Abini 3 months Ad hoc Dhivehi,E 1995

Course Title: *Ab Initio and on-the-job training for Meteorological Observers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

CORE COURSES: Aeronautical Meteorology; General Meteorology; Meteorological Instruments.

PRACTICAL ASPECTS: Surface Observations; Upper-air Observations; Chart Plotting; Meteorological Codes.

The course is conducted for newly-recruited local meteorological staff, who have completed GCE 'O' level with passes in English, Maths and Physics. It is targeted to provide training for Meteorological Observers. Each course can accommodate 10 students and training is arranged when required.

Entry: GCE O-Level - passes above C Grade in English, Maths and Physics.

MAURITIUS, The Republic of

MUS-1 **Meteorological Office, Vacoas and
Airport Meteorological Station**

TEL: (230) 686-1031

Contact The Director

FAX: (230) 686-1033

Address: Meteorological Service
 St Paul Road
 VACOAS, Mauritius

E-Mail: 100.100.3042@Compuserve.com

MUS-1-1 Key-words: MET Observation Cl. 3-4 ProfF-Bases 3 months Ad hoc English 1995

Course Title: *Training of Meteorological Personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

About 60 hours of LECTURES based on the course contents of the compendium of lecture notes for training Class III (WMO-No. 291) and Class IV (WMO-No. 266) Meteorological Personnel. About 100 hours PRACTICAL TRAINING in both the operational sections and Applied Meteorology sections of the Department. Attachment to the Airport Meteorological Station for practical training in Aviation Meteorology. Practical training in Surface and Upper-Air Observations and Instruments; coding; plotting; radio transmissions; physics of the atmosphere; climatology; elementary aeronautical meteorology; hydrometeorology; agrometeorology; energy aspects of meteorology; simple maintenance of meteorological instruments.

About 8 to 10 students from abroad may be accommodated in each course.

Entry: Cambridge School Certificate.

NETHERLANDS ANTILLES AND ARUBA

ANT-1	Meteorological Service, Curaçao	TEL:	(599-9) 683 933
Contact	Director Meteorological Service	FAX:	(599-9) 683 999
Address:	Seru Mahuma Z/N	E-M/tlx:	1102 DCA NA
	CURAÇAO		
	Netherlands Antilles and Aruba		

ANT-1-1 Key-words: MET Observation Cl.4 ProfE-Bases 2 years Ad hoc Dutch 1988

Course Title: *Meteorology course for class IV personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

An institutionalized training facility for meteorology is not available. The only important course being given on an ad hoc basis (approximately every 4-5 years), depending on local needs, is the Meteorology for class IV personnel course. The course is given in Dutch. The material used (WMO compendia for class IV) is in English.

Entry: Secondary education with 'O' levels in physics and mathematics.

NETHERLANDS, The Kingdom of the

NLD-1	IIIHEE- Delft	TEL: (31-15) 215-1715
Contact	International Institute for Infrastructural Hydraulic	FAX: (31-15) 212-2921
Address:	and Environmental Engineering (IIIHEE)	E-M/tlx: inter water
	P.O. Box 3015	
	2601 DA DELFT, The Netherlands	

NLD-1-1 Key-words: HYD Clhymet Cl. 1b ProfS-Intl 45 weeks Annual English 1995

Course Title: *International postgraduate courses in Hydrology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

There are 3 different courses (each of 45 weeks):

- (a) Hydrological Processes
- (b) Groundwater Hydrology
- (c) Water Resources Management

THE OVERALL OBJECTIVE is to give a better-science-based understanding of hydrological processes and interaction between human activities and the hydrological system. The international postgraduate course in hydrology and related subjects is primarily directed to those who have at least three years' practical experience in a job requiring application of hydrological techniques but who lack the necessary specialized background knowledge. The theoretical instruction is supplemented by extensive practical training. Fees (1995) : Nlg 10,000.

Entry: University education (B.Eng. level) in civil engineering, (hydro) geology, geophysics, agricultural engineering or a related subject.

NEW ZEALAND

NZL-1 Training Centre, Meteorological Service of New Zealand LTD TEL: (64-04) 472-9379
 Contact The Chief Executive FAX: (64-04) 473-5231
 Address: Meteorological Service of New Zealand LTD E-Mtlx: Internet: lumsden@met.co.nz
 P O. Box 722
 WELLINGTON, New Zealand

NZL-1-1 Key-words: MET PredictForec Cl. 1b ProfE-Natnl 12 months Ad hoc English 1995

Course Title: *Meteorologist Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Dynamic meteorology and introduction to numerical weather prediction; Atmospheric thermodynamics; Radiation; Cloud physics; Climatological methods; Regional climatology; Meteorological observing methods; Meteorological analysis, including nephanalysis; Prognosis and forecasting methods; Aeronautical and marine meteorology; Oceanography.

This course is usually only for employees of Meteorological Service of NZ LTD. A very limited number of overseas students could be accepted provided suitable financial arrangements were made. Instruction includes postgraduate studies at the University.

Entry: Graduate in Mathematics and/or Physics from a recognized University.

NZL-1-2 Key-words: MET Observation Cl. 3 ProfF-Natnl 12 weeks Ad hoc English 1995

Course Title: *Pacific Islands, Level III*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Geography; Satellite meteorology; Dynamical meteorology; Physical meteorology; Atmospheric thermodynamics; Mid-latitude weather systems; Tropical meteorology; Mesoscale/aviation meteorology; Climatological statistics; Instruments and inspection techniques; Observing practices; Weather chart interpretation, presentation and briefing; Subjective MSL analysis; WMO organization, communications; Management, supervision and training; Climate change/southern oscillation.

This course is non-residential. Hotel accommodation is available, costs to be met by students. Tuition fees applicable.

Entry: Minimum of three years' operational experience and nomination by own service.

NZL-2 NIWA TEL: (64-3) 343-7864
 Contact Mr J. Fenwick FAX: (64-3) 348-9762
 Address: NIWA; P.O. Box 8602 E-Mtlx:
 CHRISTCHURCH
 New Zealand

NZL-2-1 Key-words: HYD Technician Cl. 3 ProfS-Varia Flexible Ad hoc English 1988

Course Title: *Hydrological Technicians Training Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The course is composed of several modules dealing with various aspects of hydrometry, that is: field techniques; telemetry system operation; office practice in data handling; rating curve construction; microcomputer use and data processing; water quality measurements; quality assurance and quality management systems; ISO 9000 in hydrological data collection. Each module lasts approximately one week, and emphasis is placed on practical "hands-on" instruction. New Zealand practice and equipment (which is based on United States practice) is followed. The course is varied to suit participants, and is normally managed as a component of a longer term training scheme which includes a period of on-the-job experience interposed by instruction modules, as above. Participants are technical staff who have, normally, secondary or tertiary educational qualifications, and who are expected to rise to senior technical positions in their organization.

Tuition fees dependent on the selected module(s).

Entry: Sponsorship by employer; at least one year of experience in the field of hydrology; computer experience.

NIGERIA, The Federal Republic of

NGA-1 Meteorological Research and Training Institute, RMTc TEL: (234-1) 631 792
Oshodi, Lagos
 Contact: Permanent Representative with WMO FAX: (234-1) 263-4489
 Address: Meteorological Department E-M/tlx: DIMETEOR, Lagos
 Private Mail Bag 12542
 LAGOS, Nigeria

NGA-1-1 Key-words: MET Observation Cl.4 ProfF-Bases 12 months Annual English 1995

Course Title: *Meteorological Observers Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

METEOROLOGICAL CONTENT: codes and observations; meteorological instruments; aeronautical meteorological practices and procedures; upper air instruments and methods of observation; meteorological theory; meteorological chart plotting; meteorological telecommunication; teleprinter operations for data collection; introduction to climatology; agrometeorology and climatology; compilation of climatological returns; practical sessions; meteorological statistics. REVISION of ordinary level topics in physics, heat, properties of matter and mechanics.

Course starts in October. Class capacity maximum 25 students. Tuition fees (1996/97) \$ 500.

Entry: Credits in Physics, Maths and English at O Level West African School Certificate.

NGA-1-2 Key-words: MET Technician Cl.3 ProfF-Bases 12 months Annual English 1995

Course Title: *Meteorological course (Senior Observers course)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

ALL THE TOPICS IN CLASS IV, treated in greater depth and detail; INTRODUCTION to: synoptic meteorology; physical meteorology with emphasis on elements of cloud physics; agrometeorology; selected topics in tropical meteorology; general circulation of the atmosphere; elements of chart analysis - namely scalar fields. INTRODUCTION to: higher algebra; differential and integral calculus; introduction to vectors; statistics with applications to meteorology.

Course starts in October. Class capacity maximum 25 students. Tuition fees (1996/97) \$ 1,200.

Entry: Class IV Meteorological Certificate with on-the-job experience.

NGA-1-3 Key-words: MET AssistForec Cl.2 ProfE-Bases 12 months Annual English 1995

Course Title: *Meteorological course (Weather Forecasters)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

BASIC MATHEMATICS and Mathematics Methods in Meteorology, namely: algebra; solid analytical geometry; differential and integral calculus and other basic mathematics. BASIC PHYSICS and METEOROLOGY: heat and thermodynamics; meteorological thermodynamics; physical meteorology with emphasis on radiation and cloud physics; heat balance of the earth - atmosphere system; dynamic meteorology; the general circulation; synoptic meteorology of the middle latitudes; tropical meteorology with emphasis on: easterly waves, vortices, West African squall lines; monsoons and tropical disturbances; general weather forecasting techniques; general aeronautical meteorological practices and procedures. SYNOPTIC LABORATORY sessions for weather and chart analysis; elementary principles of radar and satellite meteorology.

Course starts in March. Class capacity maximum 25 students. Tuition fees (1996/97) \$ 1,200.

Entry: (i) Pass in A/O Level GCE in Physics, Maths. Credit in English in O/L, GCE/WASC;
 (ii) WMO Class III with field experience.

NGA-1-4 Key-words: MET Operational Cl.1a UnivE-Bases 4 years Annual English 1995

Course Title: *B.Sc. in Meteorology; Class I Meteorology Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Information on tuition fees is to be confirmed by the Federal University of Technology (FUT) Akure, Ondo State, Nigeria. Names of candidates to be submitted to the Head of Meteorological Department, FUT. Class capacity is maximum 20 students.

Entry: (a) Direct Entrance: WMO Class II with field experience and 5 O/L Credits in Physics, Maths and any other subjects with pass in either Chemistry or Geography. (b) Joint Admission Matriculation

Board Entrants: With 5 O Level credits in Physics, Maths and at least a pass in either Chemistry or Geography.

NGA-1-5 Key-words: MET Operational Cl. 1b UnivF-Bases 12 months Ad hoc English 1995

Course Title: *Postgraduate Diploma in Meteorology (WMO Class I)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Course starts in September. Information on tuition fees is to be confirmed by the Federal University of Technology (FUT) Akure, Ondo State, Nigeria. Names of candidates to be submitted to the Head of Meteorological Department, FUT. Class capacity is maximum 10 students.

Entry: B.Sc. Degree with Maths and Physics.

NGA-1-6 Key-words: MET Operational Cl. 1c UnivF-ET&R 24 months Ad hoc English 1995

Course Title: *M.Sc. in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

M.Sc. Specialization in either: Numerical Weather Prediction, Pollution Meteorology, Meteorological Instrumentation, Mesoscale Meteorology, Atmospheric Turbidity.

Course starts in September. Information on tuition fees is to be confirmed by the Federal University of Technology (FUT) Akure, Ondo State, Nigeria. Names of candidates to be submitted to the Head of Meteorological Department, FUT.

Entry: Upper 2nd Class Honours in B.Sc. Meteorology or Credit in Post-Graduate Diploma (Meteorology).

NGA-1-7 Key-words: MET Scientific Cl. 1c UnivS-Rsrch 36 months Ad hoc English 1995

Course Title: *Ph.D. in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Ph.D. Specialization may be in either Meteorology, Hydrometeorology, Agrometeorology, or Air Pollution.

Information on tuition fees is to be confirmed by the Federal University of Technology (FUT) Akure, Ondo State, Nigeria. Names of candidates to be submitted to the Head of Meteorological Department, FUT. Maximum 5 students.

Entry: M.Sc. in Meteorology or equivalent.

NORWAY, The Kingdom of

NOR-1 Norwegian Hydrotechnical Laboratory

TEL: (47-7) 592 300

Contact Norwegian Hydrotechnical Laboratory

FAX: (47-7) 592 480

Address: N-7034 TRONDHEIM
Norway

E-M/tlx: 55 435 nhl n

NOR-1-1 Key-words: HYD Technician Cl.2-3 Proff-Intl 7 weeks Ad hoc English 1988

Course Title: *Training Course for Hydrology Technicians*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

MAIN TOPICS: Network design (6 hrs.). Operation of stations (8 hrs.). Repair and maintenance of instruments (10 hrs.). Water resources (9 hrs.). Processing of hydrometeorological data (14 hrs.). Processing of streamflow data (21 hrs.). Hydrological analysis (27 hrs.). Case studies (46 hrs.). Operation of hand calculators (18 hrs.).

The course was run four times at the Tanzanian Ministry of Water, Dar es Salaam, Tanzania during 1983 - 87. The target group has been Tanzanian hydro-technicians, so the syllabus has been designated to Tanzanian conditions and practices in operational hydrology. Data processing and hydrological analysis has been most emphasized in the course. A large number of case studies and short exercises are included in the course to maintain the practical aspects of operational hydrology. Tuition fees not yet fixed.

Entry: Technicians' certificate in water resources engineering or equivalent.

OMAN, The Sultanate of

OMN-1 **Seeb International Airport Training Centre**

TEL: (968) 519-361

Contact Department of Meteorology

FAX: (968) 510-122

Address: P.O. Box 288, Postal Code 111

SEEB International Airport

E-M/tlx: 54.18 DGCAOMAN ON

Sultanate of Oman

OMN-1-1 Key-words: MET Observation Cl. 4 ProfF-Bases 3 months Biannual English 1995

Course Title: *Meteorological Training for Class IV Personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Earth Science: motions of the earth; gravitational field of the earth; definition of heat and temperature; solar radiation; water content of the atmosphere. General Meteorology: composition of the atmosphere; heat exchange processes in the atmosphere; air temperature; atmospheric pressure; moist air; elementary theory of the wet bulb thermometer. Synoptic Meteorology: observations; plotting; elementary analysis. Meteorological Instruments and Methods of Observation: surface observations; thermometers; surface wind measurements; rain gauges; visibility; clouds; fog; precipitation.

Entry: High school certificate (Science).

PAKISTAN, The Islamic Republic of

PAK-1	Institute of Meteorology and Geophysics, Karachi	TEL:	(92-21) 811-2223
Contact	Pakistan Meteorological Department	FAX:	(92-21) 811-2885
Address:	Institute of Meteorology and Geophysics	E-M/tx:	298.32 MET HQ PK
	P.O. Box No. 8454, University Road		
	KARACHI 75270, Pakistan		

PAK-1-1 Key-words: MET Observation Cl. 4 ProfF-AbIni 26 weeks Biannual English 1988

Course Title: *Initial Meteorology Course Class IV*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Physics, mathematics, general meteorology, meteorological instruments, observations and codes, pilot balloon work, plotting of weather maps, tabulation and compilation of data, general administration.

The course includes 18 weeks of studies and eight weeks of on-the-job training.

Entry: Standard in physics and mathematics equivalent to that of secondary school certificate examination or higher secondary certificate examination is needed.

PAK-1-2 Key-words: MET Observation Cl. 3 ProfF-AbIni 26 weeks Biannual English 1988

Course Title: *Preliminary Meteorology Course Class III*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Earth sciences; mathematics; general meteorology; dynamic meteorology; meteorological instruments; observations and codes; pilot balloon work (revision) and meteor report; plotting of weather maps (revision) and analysis of surface chart (introduction); general administration.

The course includes 18 weeks of studies and eight weeks of on-the-job training.

Entry: Higher secondary certificate together with some background in meteorology; completion of Initial Meteorology Course class IV.

PAK-1-3 Key-words: MET AssistForec Cl. 2 ProfF-Bases 52 weeks Annual English 1988

Course Title: *Basic Forecasting Course (Class II)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Physics (revision); mathematics (revision); thermodynamics of the air; atmospheric motion; climatology; synoptic meteorology; tropical meteorology; physical meteorology; analysis and forecasting; synoptic lecture-laboratory.

The course includes 28 weeks of studies and 24 weeks at a Forecasting Office.

Entry: University degree in physics and mathematics with successful completion of Preliminary Meteorology Course (class III).

PHILIPPINES, The Republic of the

PHL-1 **Philippine Atmospheric, Geophysical and Astronomical Services Administration** TEL: (63-2) 980 661
Contact Director Philippine Atmospheric, Geophysical and FAX: (63-2) 922-1872
Address: Astronomical Services Administration (PAGASA) E-M/tlx: 42021 PAGASA PM
 1424 Quezon Avenue, QUEZON CITY
 Philippines

PHL-1-1 Key-words: GEO AssistForec Cl.2 Proff-Bases 48 weeks Annual English 1988

Course Title: *Meteorologist Training Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

DYNAMIC METEOROLOGY - the equations of motion; circulation, vorticity and divergence; balanced motions; atmospheric waves; introduction to numerical weather prediction. SYNOPTIC METEOROLOGY - air masses, fronts and jet streams; the general circulation, tropical synoptic systems; synoptic weather analysis; weather forecasting; laboratory exercises. PHYSICAL METEOROLOGY - composition of the atmosphere; radiation in the atmosphere; electrical and optical phenomena; cloud physics. ATMOSPHERIC THERMODYNAMICS - thermodynamic system; heat and temperature; first law of thermodynamics; statics and thermodynamics of the atmosphere. METEOROLOGICAL INSTRUMENTS AND METHODS OF OBSERVATION - types, uses, principles of construction, exposure and maintenance of meteorological instruments; surface and upper-air observations; meteorological codes. CLIMATOLOGY - general climatology: organization of a climatological service; climatic methods and statistics. HYDROLOGY - the hydrological cycle; precipitation, evaporation, and transpiration; groundwater; surface runoff; hydrometry. OCEANOGRAPHY - physical properties of sea water; dynamics of upper ocean; heat balance of ocean; atmosphere's action on ocean. ASTRONOMY - the milky way galaxy and solar system; motions of the sun; the sidereal clock; celestial coordinates; solar time, day and mean clock. GEOPHYSICS - structural layers of the earth; crustal deformation; plate tectonics theory; earthquake faults; seismic waves. METHOD OF RESEARCH - the research problem; choice of title; outline of research; presentation of ideas; manuscript. COMPUTER PROGRAMMING - computer organization; flowchart; FORTRAN programming. ADMINISTRATIVE PROCEDURE - organization of PAGASA, civil service rules and regulations; personnel matters.

Term I (40 weeks) - Classroom instruction, including laboratory exercises. Whole day sessions. Term II (eight weeks) - On-the-job training. Whole day sessions. Tuition fees US \$ 5,000.

Entry: B.Sc. in mathematics, physics, engineering or other physical sciences, with college physics and mathematics through to integral calculus.

PHL-1-2 Key-words: MET Observation Cl.3-4 Proff-Bases 16 weeks Annual English 1988

Course Title: *Meteorological Observer Training Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

GENERAL METEOROLOGY - the composition and vertical divisions of the atmosphere; heat exchange processes; thermometry; atmospheric pressure; moisture and precipitation; vertical stability; local winds; air masses and fronts; elementary topics in synoptic and dynamic meteorology. CLIMATOLOGY - general principles of climatology; elements of climate; classification; applied and regional climatology. METHODS OF SURFACE OBSERVATION - meteorological elements; observational practices and procedures; meteorological codes. METHODS OF UPPER-AIR OBSERVATION - upper-air measurements; the upper-air codes. METEOROLOGICAL INSTRUMENTS - principles of construction; use, operation and maintenance of meteorological instruments. ELEMENTARY ASTRONOMY - the celestial sphere; the solar system; galaxy; measurement of time; other solar systems. ELEMENTARY GEOPHYSICS - structure of the earth; motions of the earth; gravitational and magnetic fields of the earth; earth's interior. COMPUTER CONCEPTS - historical background; computer organization; introduction to flowchart. ADMINISTRATIVE PROCEDURES - organization of PAGASA, civil service rules and regulations; personnel matters.

Term I (12 weeks) - Classroom instruction, including laboratory exercises. Whole day sessions. Term II (four weeks) - On-the-job training. Whole day sessions. Tuition fees US \$ 1,800.

Entry: Completion of at least two years of university education, including college algebra, physics and preferably trigonometry.

PHL-1-3 Key-words: MET Operational Cl.2 ProfS-Agric 24 weeks Annual English 1988

Course Title: *Specialized Agrometeorologist Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

AGROMETEOROLOGY - The physical environment; biological processes; microenvironment and crop production; phenology and seasonal changes; weather hazards affecting agricultural output.

AGROCLIMATOLOGY - Climatic elements; agroclimatic constraints, suitable growing areas and cropping pattern; the concept of climate and influence of large-scale geographic factors. **FARM WEATHER**

FORECASTING - Weather forecasts for agriculture; agrometeorological forecasts and warnings;

information base for the agricultural and meteorological forecasts; dissemination of the agricultural weather forecast; laboratory exercises. **AGROMETEOROLOGICAL STATISTICS** - Review of basic concepts of statistics; probability distribution; curve fitting and method of least squares; regression and correlation; analysis of time series. **CROP PROTECTION** - Pest control programmes; weather and use of pesticides; plant diseases. **AGROMETEOROLOGICAL OBSERVATION AND INSTRUMENTATION** - Agrometeorological observation procedures; principles of construction; use, operation and maintenance of agrometeorological instruments.

Term I (16 weeks) - Classroom instruction, including laboratory exercises. Whole day sessions. Term II

(eight weeks) - On-the-job training. Whole day sessions. Tuition fees US\$ 2,600.

Entry: Completion of Meteorologist Training Course or equivalent.

PHL-1-4	Key-words:	HYD Technician	Cl.2	Proff-Bases	16 weeks	Annual	English	1988
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Course Title: *Hydrological Technician Training Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

GENERAL HYDROLOGY - history of hydrology; the hydrologic cycle; river basin; river system; runoff process; streamflow. **HYDROMETEOROLOGICAL OBSERVATION** - observable elements; standard observational procedures; units of measurements; principles and methods of measurement of precipitation, evaporation, streamflow, stream velocity and discharge. **HYDROLOGICAL**

INSTRUMENTS - Introduction to instruments; observational instruments; instruments for hydrographic works; care and maintenance of instruments. **PREPARATION OF ANALYTICAL MATERIALS** -

Hydrological analysis; fundamental techniques in the preparation of graphical materials; drawing and sketching; plotting; graphs; spatial analysis. **ELEMENTARY HYDROLOGICAL ANALYSIS** - Introduction to elementary statistics; statistical and graphical analytic methods; precipitation analysis; streamflow analysis; rainfall-runoff relationship. **COMPUTER CONCEPTS** - Introduction to electronic digital computer; data processing; communicating with computer; introduction to programming; programming exercises. **INTRODUCTION TO HYDROLOGICAL FORECASTING** - the drainage basin and river system; the runoff process; antecedent conditions; dynamics of unsteady flow in open channel; time lag.

Term I (12 weeks) - Classroom instruction, including laboratory exercises. Whole day sessions. Term II

(four weeks) - On-the-job training. Whole day sessions. Tuition fees US \$1,800.

Entry: Completion of Meteorological Observer Training Course or equivalent.

PHL-2	University of the Philippines, Quezon City	TEL:	(63-2) 976 061
Contact	Department of Meteorology and Oceanography	FAX:	
Address:	College of Science	E-M/tx:	
	University of the Philippines		
	Diliman, QUEZON CITY 1101, Philippines		

PHL-2-1	Key-words:	MET Operational	Cl.1a	UnivF-Bases	2 semest	Annual	English	1988
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Course Title: *Diploma in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

This course is designed for students with little or no previous background in meteorology who wish to direct their experience to atmospheric or environmental applications. Credits earned in this programme may also be used in satisfying part of the requirements for an M.Sc. (Meteorology) or Ph.D. (Meteorology) degree should the student decide to earn a higher degree. **CORE COURSES** (3 credit units each course): Synoptic Meteorology; Synoptic Meteorology Practicum; Geophysical Fluid Dynamics; Climatology; Dynamic Meteorology. **ELECTIVES** (6 credit units).

The Diploma in Meteorology Programme is a two-semester programme in theoretical and applied meteorology. To obtain the Diploma in Meteorology, a student must complete a minimum of 24 units of formal graduate courses and maintain a cumulative weighted average grade of "2.0" or better in his or her course work. All requirements for the Diploma shall be completed in not more than three calendar years including leaves of absence. Education Development fee (for foreign students) US\$ 250 and US\$ 5 /unit.

Entry: B.Sc. physics, mathematics, engineering or other appropriate disciplines.

PHL--2--2 Key-words: MET Scientific Cl. 1c UnivS-Atmos 2 years Annual English 1988

Course Title: *M.Sc. in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

CORE COURSES (3 credit units each course): Synoptic Meteorology; Synoptic Meteorology Practicum; Geophysical Fluid Dynamics; Climatology; Physical Meteorology; Dynamic Meteorology.

The M.Sc. (Meteorology) degree may be obtained through either the thesis option or the non-thesis option.

THESIS OPTION: to qualify for the M.Sc. Meteorology degree under the thesis option, a student must (a) complete a minimum of 24 units of formal graduate courses consisting of 18 units of core courses and at least six units of electives or specialization courses; (b) maintain a cumulative weighted average grade of "2.0" or better in his or her graduate courses at the end of each academic year, (c) complete one (1) unit of a graduate seminar course; (d) successfully defend a Master's Thesis in a masteral examination; and (e) submit at least six (6) bound and certified copies of the approved Master's Thesis.

NON-THESIS OPTION: under this option, the student must (a) complete a minimum of 33 units of formal graduate courses consisting of 18 units of core courses and at least 15 units of electives or specialization course; (b) maintain a cumulative weighted average grade of "2.0" or better in his or her graduate courses at the end of each academic year; (c) complete one (1) unit of a graduate seminar course; (d) pass the preliminary examination; and (e) pass the qualifying examination. Education Development fee (for foreign students) US\$ 250 and US\$ 5 /unit.

Entry: B.Sc. with sound background in physics and mathematics and must possess a high degree of intellectual capacity.

PHL--2--3 Key-words: GEO Scientific Cl. 1c UnivS-Ocean 2 years Annual English 1988

Course Title: *M.Sc. in Physical Oceanography*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

CORE COURSES (3 credit units each course): Geophysical Fluid Dynamics; Physical Oceanography; Instrumentation and Observation Techniques; Dynamics of Oceans I; Waves and Tides; Biological Oceanography.

The M.Sc. (Physical Oceanography) degree may be obtained through either the thesis option or the non-thesis option. The general requirements for this degree are identical to those required for the M.Sc. (Meteorology) degree. Education Development fees (for foreign students) US\$ 250 and US\$ 5 /unit.

Entry: B.Sc. with sound background in physics and mathematics and must possess a high degree of intellectual capacity.

PHL--2--4 Key-words: MET Scientific Cl. 1c UnivS-ET&R 3 years Annual English 1988

Course Title: *Ph.D. in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

CORE COURSES (3 credit units each): Synoptic Meteorology; Synoptic Meteorology Practicum; Geophysical Fluid Dynamics; Climatology; Physical Meteorology; Dynamic Meteorology; Advanced Dynamic Meteorology.

Qualifications for the Ph.D. (Meteorology) degree requires the following: a) completion of a programme of study consisting of at least 45 units of formal graduate courses in the case of students admitted into the Ph.D. program with only a B.S. degree and at least 24 units of formal graduate courses in the case of students admitted into the programme with an M.Sc. (Meteorology or Physical Oceanography) degree; b) maintenance of a cumulative weighted average of "1.75" or better at the end of each academic year until completion of the programme; c) passing of the Preliminary Exam based on the core courses of the student's programme of study; d) passing of the Candidacy Examination after completion of at least two-thirds (2/3) of the student's programme of study; e) completion and successful defense of the Doctoral Dissertation in a public Doctoral Examination; f) completion of a graduate seminar course during the student's course work and presentation of a yearly seminar report during the student's dissertation work; g) submission of a scientific preprint based on the approved Doctoral Dissertation and endorsed by the Dissertation Committee as an acceptable article for publication in a reputable scientific journal; h) submission of at least six (6) bound and certified copied of the approved Doctoral Dissertation. Core Courses: Applicants must have a very high degree of intellectual capacity and aptitude for advanced study and research. Educational Development Fee (for foreign students) US\$ 250 and US\$ 5/unit.

Entry: B.Sc. or an M.Sc. (Meteorology) or Physical Oceanography degree from a recognized institution of higher learning. Applicants must have a strong background in physics and mathematics.

QATAR, The State of

QAT-1	Department of Civil Aviation and Meteorology, Doha	TEL:	(974) 42.62.62
Contact	The Director	FAX:	(974) 429 070
Address:	Department of Civil Aviation and Meteorology	E-M/tlx:	4306 METEOR DH
	P.O. Box 3000		
	DOHA, Qatar		

QAT-1-1 Key-words: MET Operational Cl.3-4 ProfF-Bases 40 weeks Ad hoc English 1995

Course Title: *Operational Meteorological Observers, Technicians*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

GENERAL METEOROLOGY: Atmosphere; Vertical Divisions; Heat Exchange Processes; Heat Capacity; Radiation; Convection and Turbulence; Temperature; Moisture Parameters; Atmospheric Pressure - Measurement Units, Instruments (barometers), Corrections, Standard conditions; Altimetry - Standard Levels, Standard ICAO Atmosphere. WINDS. Forces in the atmosphere; Causes of Winds; Geostrophic Wind; Gradient Wind; Local Winds; Seasonal Winds. METEOROLOGICAL ELEMENTS: Definitions; Observing and Coding the following: Surface Wind; Visibility; Clouds; Weather; Temperature; Sunshine; Radiation; Evaporation; Precipitation; Pressure - QNH, QPE, QFF, etc. WEATHER and CLIMATE: Basics of the General Circulation of the Atmosphere; Climatic Zones; Monsoon Patterns and Influence of Weather over the Gulf Region; Inter-Tropical Convergence Zone. METEOROLOGICAL CODES: Coding; Decoding; Plotting on Synoptic Charts; Aerological Diagrams (tephigram). UPPER-AIR OBSERVATIONS: Pilot Balloon - Preparation, Safety Precaution, Observation, Computation (slide rule), Coding and Transmission; Radiosonde Observation - Preparation, Safety Precautions, Observation, Coding and Transmission. CLIMATOLOGICAL SUMMARIES: Processing and Reduction of Automatically Recorded Data; Preparation of Weekly, Monthly, and Annual Summaries. BASICS of METEOROLOGICAL REQUIREMENT for SPECIALIZED USES: Aviation Meteorology; Marine Meteorology; Agricultural Meteorology; Pollution - Environmental Issues; Climatology and Climate Change. METEOROLOGICAL INSTRUMENTS: each type of instrument is taught together with the parameter under study - Basis Behind Instrument Construction; Installation; Operation and Simple Maintenance. METEOROLOGICAL TELECOMMUNICATIONS: Global Telecommunication System (GTS); Organization and Operation; Telecommunications Codes and Formats; Affiliated Systems, e.g. AFTN; Monitoring the Operation of GTS.

Entry: Secondary school certificate with good passes in English, Mathematics and Science.

QAT-2	Air Navigation Services Training Division, Doha	TEL:	(974) 652 288
Contact	Civil Aviation College	FAX:	(974) 652 646
Address:	P.O. Box 4050	E-M/tlx:	100412.3352@compuserve.com
	DOHA, Qatar		

QAT-2-1 Key-words: MET PredictForec Cl.2 ProfF-AbIni 42 weeks Ad hoc English 1995

Course Title: *Aeronautical Meteorological Forecaster - WMO MET Class II*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Mathematics; Synoptic Meteorology; Atmospheric Thermodynamics; Meteorological Statistics; Dynamic Meteorology; Cloud Physics; Physical Meteorology; Radar/Satellite Meteorology; Aeronautical Meteorology; Marine Meteorology; Hydrometeorology; Weather Analysis and Forecasting.

Entry: WMO Class III Certificate, plus entrance examination in English, Mathematics, Science.

QAT-2-2 Key-words: MET Operational Cl.3 ProfF-AbIni 28 weeks Ad hoc English 1995

Course Title: *Aeronautical Meteorological Assistant - WMO MET Class III*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

English; Mathematics; Physics; General Chemistry; General Meteorology; Meteorological Instruments and Methods of Observation; Meteorological Codes and Transmission Procedures; Meteorological Statistics; Atmospheric Physics; Aeronautical Meteorology; Physical Meteorology; Computers and Data Processing; Synoptic Meteorology; Tropical Meteorology; Climatology; Dynamic Meteorology; Radar and Satellite Meteorology.

Entry: Secondary School Diploma, plus entrance examination in English, Mathematics and Science.

ROMANIA

ROM-1	University of Bucharest, Faculty of Physics	TEL:	(40-1) 312-3127
Contact	Scientific Secretary, Faculty of Physics	FAX:	(40-1) 312-3127
Address:	Department of Atmospheric Physics	E-M/tx:	mecanica.mecanica.@.fizica.fizica.unibuc.ro
	P.O. Box M.G. -11,7690, Magurele		
	BUCHAREST, Romania		

ROM-1-1 Key-words: MET Operational Cl.1a UnivE-Bases 5 years Annual Romanian,E 1995

Course Title: *Studies leading to B.Sc. Degree in Physics, speciality Meteorology - Class I*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

BASIC SCIENCE Courses: higher mathematics; mechanics; general physics (heat, molecular physics, acoustics); electricity; spectroscopy; chemistry; theoretical mechanics; thermodynamics; statistical physics; atomic physics; electrodynamics; theory of relativity; quantum mechanics; solid-state physics; computer sciences and numerical methods. SPECIALIZED TRAINING Courses: atmospheric thermodynamics; terrestrial magnetism; seismology; atmospheric dynamics; physics of the liquid state; cloud physics; gravimetry; tectonics; weather forecasting; physics of the planetary boundary layer; physics of the interaction processes between the atmosphere and the planetary ocean; atmospheric electricity; air pollution.

Duration of the instruction is five years: the first three years for Basic Sciences education and the last two years for Specialized Education and Training. The concerned courses provide the essential bases for a Class I meteorologist qualification and subsequently, the attendants may either work as operational officers or may continue studies for a higher university degree, i.e. Ph.D., see Course ROM-1-3. Up to 20 students can be admitted every year. Starting date: 1 October. Accommodation may be provided in student hostels on the University Campus. Tuition fees: none for the Romanian nationals; approximately \$ 400 per month for foreign students, full board included. These fees are subject to change. For the Basic Sciences, there are two special student groups where courses are given in English and in French, respectively. During this three-year period, foreign students can learn the Romanian language; a preliminary six-month language course is also available.

Entry: Secondary School Graduates (12 years of schooling) with good preparation in mathematics and/or physics (lyceum graduates from classes with enhanced programme in mathematics or physics).

ROM-1-2 Key-words: MET Operational Cl.1b ProfS-Rfrsh 1-2 weeks Ad hoc Romanian 1995

Course Title: *Post-graduate Refresher Courses in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The framework Curricula follows the WMO Publication No. 258 - sections for Advanced/Specialization Training. However, the actual focus of the instruction may vary for each training session, according to its specific requirements.

Courses are organized jointly by the Faculty of Physics and the National Institute of Meteorology and Hydrology (NIMH) Bucharest. Specialists from NIMH deliver the "on-the-job" training component(s) and some parts of the theoretical training. Usually, the trainees belong to the NMHS, and the number of students is less than 10 per session. Further information may be obtained from the Scientific Secretary of NIMH (see address given for course ROM-7-1).

Entry: Certified Meteorologists of Class I.

ROM-1-3 Key-words: GEO Scientific Cl.1c UnivS-ET&R 3-4 years Annual Romanian,E 1995

Course Title: *Postgraduate Programme leading to Ph.D. in Physics of: (a) the Atmosphere; (b) the Earth*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Advanced-level studies in two (three) disciplines selected from: Atmospheric Physics and Thermodynamics, Dynamic Meteorology, Planetary Boundary Layer, Dynamical Systems and Numerical Methods. Two (three) specific exams and three (two) intermediate projects, established by the supervising professor in consultation with the candidate, have to be accomplished during the first two (three) years. During the third (fourth) year, the candidate has to complete his or her Ph.D. thesis project, which must be defended in public, in front of a commission consisting of the Ph.D. supervising professor and three external examiners formally designated by the University Rectorat.

Accommodation can be provided in student hostels located on the University Campus. Tuition fees: none for Romanian nationals; approximately \$ 400 per month, for foreign students, full board included. Fees are

subject to change. A six-month preparatory course for learning the Romanian language is available.

Entry: Candidates must possess a B.Sc. degree in Physics, and are selected by competitive examination.

ROM-2	University of Bucharest, Faculty of Geography	TEL: (40-1) 614-3508
Contact:	The Dean of the Faculty of Geography	FAX:
Address:	University of Bucharest	E-M/tlx:
	Nicolae Balcescu Street No 1; sector 1	
	BUCHAREST 70111, Romania	

ROM-2-1 Key-words: ENV Clhymet Cl.1a UnivE-Geogr 4 years Annual Romanian 1995

Course Title: *Studies leading to B.Sc. in Environmental Sciences*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

GENERAL COURSES: elements of higher mathematics; physical geography; geomorphology; physical geology; topography and mapping; general meteorology and climatology; general hydrology.

SPECIAL COURSES: environmental physics and chemistry; applied statistics; remote sensing; environmental pollution monitoring; global environmental matters; environmental policy and legislation; environment and public welfare; environmental education.

Tuition fees: none for Romanian nationals; approximately \$ 300 per month for foreign students, costs for accommodation in student hostel and full boarding included. These fees are subject to change. On request, foreign students may attend a preparatory course to learn the Romanian language. Starting date: 1 October.

Entry: Secondary School Graduates (12 years of schooling).

ROM-2-2 Key-words: ENV Operational Cl.1c UnivS-Envir 1 year Annual Romanian 1995

Course Title: *Post-graduate course leading to M.Sc. in Environmental Planning*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Courses include: environmental planning; laboratory techniques and analyses; environmental modelling; environmental data processing and predictions.

Up to 20 students per year. Accommodation may be provided in student hostels. Tuition fees: none for Romanian nationals; approximately \$ 340 per month for foreign students. Fees are subject to change. Starting date: 1 October.

Entry: B.Sc. Degree in Environmental Sciences.

ROM-3	Polytechnical University of Bucharest	TEL: (40-1) 410-4350
Contact:	The Dean, Faculty of Energetics	FAX: (40-1) 312-3161
Address:	Polytechnical University of Bucharest	E-M/tlx:
	Splaiul Independentei Street No. 313	
	BUCHAREST, Sector VI, Romania	

ROM-3-1 Key-words: HYD Clhymet Cl.1a UnivF-Bases 5 years Annual Romanian 1995

Course Title: *Diploma Course in Energetics (Hydrologist Class I)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

BASIC SCIENCE Courses: higher mathematics including: higher algebra, plane and space geometry, differential and integral calculus, partial differential and integral equations, probability theory and statistics, numerical methods and computer sciences; general physics; mechanics and materials' resistance; thermotechnics; chemistry; technology of metals; hydraulics; measurements of electrical and non-electrical parameters. SPECIALIZED TRAINING Courses: river hydraulics; electrical mechanisms; electrical power plants; hydrology and environmental protection; management in energetics.

Up to 100 students per year can be admitted. Accommodation can be provided in students' hostels. Tuition fees: none for Romanian nationals and approximately \$ 320 per months for foreign students, full boarding included. Fees are subject to change.

Entry: Secondary School Graduates (12 years of schooling), with good preparation in mathematics, physics (lyceum graduates from classes with enhanced programme in mathematics or physics).

ROM-4 Institute for Civil Constructions of Bucharest TEL: (40-1) 240-7330
 Contact The Dean, Faculty of Hydraulic Structures FAX: (40-1) 312-7780
 Address: Technical University for Civil Engineering E-M/tlx:
 Lacul Tei Street No 124, code 72302
 BUCHAREST, Sector II; Romania

ROM-4-1 Key-words: HYD Clhymet Cl.1a UnivF-Bases 5 years Annual Romanian 1995

Course Title: *Diploma Course in: (a) Hydraulic Structures, (b) Environmental Engineering*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

BASIC SCIENCE Courses: higher mathematics including: higher algebra, differential and integral calculus, partial differential and integral equations, probability and statistics theory, numerical and graphical calculations; mechanics; general physics; chemistry; technical drawing; topography; computer programming.

SPECIALIZED TRAINING Courses: statics; dynamics and stability of constructions; materials' resistance; thermotechnology; electrotechnology; general hydraulics; streamflow and hydrological calculations; hydrotechnical constructions; geology; seismology; water management (water resources assessment and calculations); ecological impact of the hydrotechnical constructions.

Up to 100 students per year can be admitted. Accommodation can be provided in students' hostels. Tuition fees: none for Romanian nationals; approximately \$ 320 per months for foreign students, full boarding included. Fees are subject to change. Starting date: 1 October.

Entry: Secondary School Graduates (12 years of schooling) with good preparation in mathematics and/or physics.

ROM-5 Undergraduate School for Water Management and Meteorology, Craiova TEL: (40-051) 113 286
 Contact The Secretary FAX: (40-051) 112 826
 Address: Undergraduate School for Water Management and Meteorology Craiova. Brestei Street No 97 E-M/tlx:
 CRAIOVA 1100, Romania

ROM-5-1 Key-words: MoH Observation Cl.4 ProfF-Bases 4 years Annual Romanian 1995

Course Title: *Secondary School for class IV meteorologist, hydrologist or chemistry laboratory assistant*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

BASIC SCIENCE Courses: mathematics (algebra, trigonometry, geometry, elements of differential and integral calculus); physics (mechanics, thermodynamics, electricity, optics); chemistry; biology. "Auxiliary Disciplines": geography, foreign languages (French, English, German); logics, economy, sociology, philosophy.

PROFESSIONAL TRAINING Courses: (a) METEOROLOGIST: general meteorology; meteorological instruments; meteorological observations and codification; climatology; agrometeorology; aerology and synoptic meteorology; ecology and protection of air quality; radiometry; natural radioactivity; legislation and organization of meteorological activity; computer operation. (b) HYDROLOGIST: general hydrology and hydraulics; technical drawing; equipment and techniques of hydraulic structures; water management; hydrometry and hydrography; topography and water cadasters; ecology and protection of water quality; computer operation. (c) CHEMISTRY LABORATORY ASSISTANT: water chemistry and biology; instruments and techniques for chemical measurements; elements of bio- and hydro-chemistry; ecology and protection of air and water quality; computer operation.

Courses start on 15 September, each year. Courses for Basic Sciences and Auxiliary Disciplines are common for all three specialities. "Practical works", specific for each speciality, include: either 180 hours throughout the school year, or (pending the actual instruction programme) one month at the end of the school year. Up to 30 students a year can be admitted. Following the completion of the courses, the graduate obtains a diploma of meteorological, or hydrological observer, or diploma of laboratory assistant. Accommodation may be provided in school's student hostels, or in private lodging. Tuition fees: none for Romanian nationals; foreign students may obtain updated information on request.

Entry: Complete gymnasium (8 years schooling) education.

ROM-5-2 Key-words: MoH Operational Cl.3 ProfF-Bases 2 years Annual Romanian 1995

Course Title: *Post-Secondary School for class III meteorologist or hydrologist*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

METEOROLOGIST - Specific Training: general meteorology; climatology; agrometeorology; synoptical and dynamical meteorology; instruments and methods of observation; elements of radiometry and natural radioactivity; aerology; global observing systems; climatological statistics and meteorological codes; representation of climatological data. **HYDROLOGIST** - Specific Training: general hydrology; hydrometry; hydraulic structures; water resources management and calculations; hydrological forecasting; principles of technical drawings; topography and water cadasters. **HYDROMETEOROLOGIST** - General Training: ecology and protection of water and air quality; elements of informatics; hydrometeorological informational system and automated data processing. A 10-week period is dedicated to practical work and on-the-job training.

Courses start on 1 October, each year. Up to 30 students a year. Following the completion of the courses, the graduate obtains a diploma of class III meteorologist or hydrologist. Accommodation and full boarding may be provided in the hostels of the school.

Entry: Graduate of Secondary School for Class IV meteorologist/hydrologist, see Course ROM-5-1, or lyceum graduate of a specialized class of meteorology/hydrology.

ROM-6	The Aeronautical Staff Training Centre, Bucharest	TEL: (40-1) 212-3007
Contact:	Head of Meteorological Division, ROMATSA	FAX: (40-1) 312-2442
Address:	Romanian Air Traffic Services Administration Ion Ionescu de la Brad Street No 1, PO Box 18-90 BUCHAREST 71952, Romania	E-Mail: 11379 AIRBUHR

ROM-6-1 Key-words: MET Observation Cl.4 ProFF-Aeron 9 months Ad hoc Romanian 1995

Course Title: *Basic Training of Class IV aeronautical meteorologists*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction to earth science; general meteorology; elements of synoptical and dynamical meteorology; meteorological instruments and methods of observation; general, regional and airport climatology; aeronautical meteorology - theoretical knowledge and observations required in aviation meteorology; reporting, coding and dissemination of weather information; meteorological codes; procedures for disseminating weather information at airports, including the special needs of ATC units; procedures for preparing the plain-language forms of meteorological messages; aviation knowledge: ICAO definition of terms; procedures for meteorological services; air traffic services; aeronautical information services; aeronautical meteorology telecommunications and data processing.

Up to 20 students per course may be accepted. Accommodation may be provided in ROMATSA's Hotel. The actual training consists of two Parts: Part 1 - five months' theoretical training; and Part 2 - four months' on-the-job training. Tuition fees: \$ 730.

Entry: Secondary School Graduates (12 years of schooling) with good background in mathematics/physics or graduates from the Secondary School of Meteorology.

ROM-6-2 Key-words: MET Operational Cl.3 ProFF-Aeron 7 months Ad hoc Romanian 1995

Course Title: *Basic Training of Class III aeronautical meteorologists*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General meteorology; elements of atmospheric thermodynamics; clouds, fog and precipitation formation; synoptical and dynamical meteorology; atmospheric turbulence; icing; general and local circulation systems; jet streams; elements of atmospheric optics and electricity; elements of air pollution; the synoptic observation network; synoptic weather charts upper-air measurements; general, regional and airport climatology; aeronautical meteorology; meteorological phenomena hazardous to aviation; meteorological aspects of flight planning; reporting, coding and disseminating weather information; ICAO definition of terms; procedures for meteorological services; operation of the aircraft; aeronautical information services, telecommunications and meteorological data processing.

Up to 20 students per course may be accepted. Accommodation may be provided in ROMATSA's Hotel. The actual training consists of two Parts: Part 1 - three months' theoretical training; and Part 2 - four months' on-the-job training. Tuition fees: \$ 430.

Entry: Secondary School Graduates (12 years of schooling) with good background in mathematics and/or physics, or graduates from the Secondary School of Meteorology, or Class IV aeronautical meteorologists.

ROM-7	National Institute of Meteorology and Hydrology, Bucharest	TEL: (40-1) 312-9842
Contact	Scientific Secretary	FAX: (40-1) 312-9843
Address:	National Institute of Meteorology and Hydrology Soseaua Bucuresti-Ploiesti No 97, Sector 1 BUCHAREST, 77552, Romania	E-M/tlx: Name.@.meteo.imh.ro

ROM-7-1 Key-words: MoH Operational Cl.2-4 ProfS-Rfrsh Flexible Ad hoc Romanian 1995

Course Title: *Refresher/Specialization Courses for Class II, III or IV meteorologists/hydrologists*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Curriculum is focused, according to the requirements, on specific fields such as: weather forecasting; climatology; aerology; meteorological radars and satellites; meteorological instruments; operational hydrology; water resources assessment.

The courses are aimed at: either facilitating operational implementation of new/improved procedures, methods, techniques, or refreshing/ updating the knowledge and skill of individual meteorologists or hydrologists. Usually, courses are conducted by senior scientists from NIMH. The duration of courses is flexible, most often one or two weeks. There are no tuition fees.

Entry: Certified meteorologists and hydrologists working in the NMHS or in the field offices/stations throughout the country.

ROM-8	Secondary School for Water Management, Arad	TEL: (40-057) 233 648
Contact	The Secretary	FAX:
Address:	Secondary School for Water Mangement Nicolae Grigorescu Street No 8 ARAD 2900, Romania.	E-M/tlx:

ROM-8-1 Key-words. MoH Observation Cl.4 ProfF-Bases 4 years Annual Romanian 1995

Course Title: *Training of Class IV meteorologists, hydrologists or chemistry laboratory assistants*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

See presentation for the course ROM-5-1.

Entry: Complete gymnasium education (eight years of schooling).

SAUDI ARABIA, The Kingdom of

SAU-1 King Abdulaziz University, Jeddah

TEL: (966-2) 695-2371

Contact King Abdulaziz University

FAX:

Address: Faculty of Meteorology, Environmental and

E-M/tlx: Jameatabdulaziz

Arid-Land Agriculture

P.O. Box 9034, 21413 JEDDAH, Saudi Arabia

SAU-1-1 Key-words: ENV Operational Cl.1b-2 UnivS-IDisc Flexible Annual English 1988

Course Title: *M.Sc. programme in meteorology, hydrology, environment and arid-land agriculture*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Information to be provided on request.

Admission is open to a limited number of foreign students. No tuition fees.

Entry: Higher secondary school education.

SEYCHELLES, The Republic of

SYC-1	Meteorological Services, Seychelles	TEL:	(248) 373 377
Contact	Director	FAX:	(248) 373 222
Address:	Meteorological Services	E-M/tlx:	2239
	P.O. Box 181		
	VICTORIA MAHE, Seychelles		

SYC-1-1 Key-words: MET Observation Cl.4 ProfE-Aeron 10 weeks Ad hoc English 1995

Course Title: *WMO Class IV personnel training*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Earth Science; General Meteorology; Meteorological Instruments and Methods of Observation;
Climatology; Physical Oceanography; Aeronautical Meteorology.

Entry: "O" level Mathematics, Physics, English and Other Scientific Subjects.

SIERRA LEONE, The Republic of

SLE-1	Meteorological Training School, Freetown	TEL: (232-22) 226 692
Contact:	The Director, Meteorological Department	FAX:
Address:	Meteorological Training School, Tower Hill F. 18 Charlotte Street FREETOWN, Sierra Leone	E-M/tlx: DIMETEO FREETOWN

SLE-1-1 Key-words: ENV AssistForec Cl. 4 ProfF-Bases 6-9 months Ad hoc English 1995

Course Title: *Training of Observers Class IV Meteorological Personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Elementary theoretical meteorology (including the necessary elementary physics and mathematics);
Practical meteorological observation techniques including upper-air accents; Coding and decoding
procedures of meteorological elements; Plotting of weather charts, elementary analysis and interpretations;
Aeronautical meteorological practices; Basic maintenance and operation of meteorological instruments;
Basic statistics of climatological elements, returns, summaries for weather bulletins and publications.

A limited space is reserved for foreign students. The school has no accommodation and boarding facilities
or sponsorship possibilities at the moment. Tuition fees and other charges are negotiated through the Met
Directorate. Certificates are issued on completion of the course. The Directorate is willing to assist with
further information, if necessary.

Entry: G.C.E. "O" Level with credits in mathematics and physics. Excellent knowledge of English.

SLE-1-2 Key-words: GEO Observation Cl. 3 ProfS-Rfrsh 4 weeks Ad hoc English 1995

Course Title: *Refresher Course for Senior Observers (Class III)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Revision of Class IV Syllabus, see course SLE-1-1. Theoretical approach to basic meteorology and related
fields; Basic hydromet, agromet, marine and environmental meteorology; Advanced procedures and
knowledge in statistics and climatological analysis.

See also additional information under course SLE-1-1.

Entry: Class IV Meteorological personnel with at least four years of practical experience. Excellent
knowledge of English.

SLE-1-3 Key-words: HYD PredictForec Cl. 1a-2 ProfF-OJT 6 months Ad hoc English 1995

Course Title: *On-the-job training for forecasters (Class I, II)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Practical forecasting exercises including the computation and analysis of weather charts;
Preparation of area, flight and route forecasts, meteorological briefing on current weather charts;
Public weather forecasting;
Climate of Sierra Leone and West Africa in general.

See also additional information under course SLE-1-1.

Entry: Completion of a formal Class I or Class II meteorological training. Excellent knowledge of English.

SLE-1-4 Key-words: MET Operational Cl. 1b-4 ProfF-Abini Flexible Ad hoc English 1995

Course Title: *Courses for non-meteorological personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Approach to basic meteorology and instruments; Approach to the needs of the Organization/ Agency.

See also additional information under course SLE-1-1.

Entry: Completion of a formal professional course and by recommendation. Excellent knowledge of
English.

SINGAPORE, The Republic of

SGP-1	Meteorological Service Singapore	TEL: (65) 545-7190
Contact	The Director, Meteorological Service	FAX: (65) 545-7192
Address:	P.O. Box 8, Changi Airport Post Office	E-M/lix: WEATHER
	SINGAPORE 918141	
	Republic of Singapore	

SGP-1-1 Key-words: MET Observation Cl.3 ProfF-Bases 15 weeks Ad hoc English 1995

Course Title: *Training course for meteorological observers/assistants (Class III)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Elementary meteorology; observing practices; meteorological codes; plotting of weather charts; preparation of thermodynamic diagrams; climatological summaries and statistics; care and maintenance of meteorological instruments; radiosonde and pilot balloon observations; use of HRPT/GMS equipment and automatic upper-air sounding system; instruments operation and use of computerized telecommunication, observing and processing systems.

Entry: GCE "O" Level with three science or technical subjects.

SGP-1-2 Key-words: MET InstrumEquip Cl.1b ProfF-DataP 2 months Annual English 1995

Course Title: *Software Development for Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The course is designed to provide basic training to meteorologists who will be required to design and develop software for meteorological applications. The FIRST PART of the course consists of four weeks of classroom lectures on general topics together with practical sessions. The topics include: FORTRAN Programming; C Language; Graphics and Plotting Routines; Introduction to Presentation and Report Writing Tools. The SECOND PART of the course is devoted largely to projects selected by individual students according to their area of interest.

Assistance available through ASEAN Training Award Scheme and Colombo Plan Technical Assistance Scheme.

Entry: University Degree.

SLOVAKIA; The Slovak Republic

SVK-1	SHMI, Training Centre, 058 01 POPRAD-Ganovce	TEL: (42-7) 371 247
Contact	Slovak Hydrometeorological Institute	FAX: (42-7) 374 593
Address:	Jeséniova 17	E-M/tlx: ONDRAS@SHMUVAX.SHMU.SK
	833 15 BRATISLAVA	
	Slovakia	

SVK-1-1 Key-words: MET Observation Cl.3-4 Proff-Ablni 1 week Ad hoc Slovak,E,R 1995

Course Title: *Course for Meteorological Observers - Fundamental Meteorological Education*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Syllabus WMO No. 258 - Fundamental.

Accommodation: low-cost accommodation due to the assistance of the SHMI, within the premises of the training institute. Boarding facilities: possibility of low-cost feeding in the local canteen of the Training Centre. Registration deadline: end of August. Starting date of course: applicants will be informed directly, as the starting date depends on the number of applicants. Tuition fees: \$ 100 per applicant, per course. Sponsorship possibilities: training institute will provide accommodation at 50% cost of the normal charge. Information Contact: SHMI, Training Centre, 058 01 Poprad-Ganovce, Slovakia.

Entry: Secondary School Certificate in Maths and Physics.

SVK-1-2 Key-words: MET Observation Cl.3-4 Proff-Advan 1 week Biannual Slovak,E,R 1995

Course Title: *Course for Meteorological Observers - Advanced Training*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Syllabus WMO No. 258 - Advanced.

See also additional information under course SVK-1-1.

Entry: Secondary School Certificate in Maths and Physics.

SVK-1-3 Key-words: MET Observation Cl.3-4 ProfS-NclPP 1 week Biannual Slovak,E,R 1995

Course Title: *Course for Meteorological Observers - Specialization*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Syllabus WMO No. 258 - Specialization. In addition: Duties of the observers in the meteorological provision for Nuclear Power-Plants.

See also additional information under course SVK-1-1.

Entry: Secondary School Certificate in Maths and Physics.

SVK-1-4 Key-words: MET PredictForec Cl.1b-2 ProfS-Speci 2 weeks Annual Slovak,E,R 1995

Course Title: *New Techniques and Technologies*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Numerical Weather Prediction. Data Systems: new techniques and methods of meteorological data processing; Operational use of meteorological data and their management. New Technologies and their implication for operational meteorology: interpretation and use of satellite and radar data in forecasting. Communication Techniques and Procedures: computer networks; Internet. Computer Applications.

See also additional information under course SVK-1-1.

Entry: University Graduates.

SVK-1-5 Key-words: MET Clhymet Cl.1b-2 ProfS-Clima 2 weeks Annual Slovak,E,R 1995

Course Title: *CLICOM*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The latest system developments. The latest hardware and software specifications. Integrated climate data management system. The creation of datasets. Calculation of climatic characteristics and parameters. Preparation of climatological products. CLICOM networking.

See also additional information under course SVK-1-1.

Entry: Graduate/Undergraduate.

SVK--1--6 Key-words: MET Scientific Cl. 1b ProfS-Train 1 week Annual Slovak,E,R 1995

Course Title: *Training of Trainers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

New techniques and methods for instructing meteorological personnel: curriculum developments; teaching techniques; evaluation; testing; CAL.

Upgrading knowledge in specialized fields of meteorology: meteorological instrumentation; interpretation and use of satellite and radar data; NWP; communication techniques and procedures.

See also additional information under course SVK--1--1.

Entry: Graduates.

SLOVENIA, The Republic of

SVN--1 University of Ljubljana

TEL: (386-61) 133-6028

Contact Permanent Representative with WMO

FAX: (386-61) 133-1396

Address: Director of the Hydrometeorological Institute
Vojkova 1/b, 61000
LJUBLJANA, Slovenia

E-M/tlx: 316.20

SVN-1-1 Key-words: MET Operational Cl. 1a UnivF-Bases 4 years Annual Slovene 1988

Course Title: *Training of junior technical personnel for the Hydrometeorological Service*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

FIRST TWO YEARS: mathematics and physics; additional courses in thermodynamics and hydrodynamics.

SECOND TWO YEARS: dynamic meteorology; weather analysis and forecasting; application of meteorology; physical meteorology; climatology; observations and meteorological instruments; biometeorology and a short course in geophysics.

No tuition fees.

Entry: Secondary school final examination certificate.

SOUTH AFRICA, The Republic of

ZAF-1	University of Pretoria	TEL: (27-12) 420-2173
Contact	University of Pretoria	FAX: (27-12) 433 589
Address:	Engineering Department, Meteorology PRETORIA 0001 South Africa	E-M/tlx: vhee-jefanella.ee.up.ac.za

ZAF-1-1 Key-words: MET Scientific Cl. 1a UnivE-Advan 3 years Annual Africaans,E 1995

Course Title: *B.Sc. (Atmospheric sciences - Meteorology)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General Meteorology; Dynamic and Physical Meteorology; Synoptic Meteorology; Numerical Methods; Cloud Physics; Radar Meteorology; Radiation; Climatology; Mathematics; Physics.

Entry: Senior Certificate with Mathematics and Physics.

ZAF-1-2 Key-words: MET Scientific Cl. 1c UnivE-Advan 1 year Annual Africaans,E 1995

Course Title: *B.Sc. Honours (Atmospheric Sciences - Meteorology)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Numerical Meteorology; Radiation; General circulation and forecasting techniques; Boundary layer and mesoscale processes.

Entry: B.Sc. (Atmospheric Sciences - Meteorology).

ZAF-1-3 Key-words: MET Scientific Cl. 1c UnivE-Advan Flexible Annual Africaans,E 1995

Course Title: *M.Sc. and Ph.D. (Atmospheric Sciences - Meteorology)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Entry: B.Sc. Honours (Atmospheric Sciences - Meteorology)

ZAF-2	Pretoria Technikon	TEL: (27-12) 318-5091
Contact	Pretoria Technikon	FAX: (27-12) 318-5688
Address:	Engineering Department Private Bag X680 PRETORIA 0001, South Africa	E-M/tlx:

ZAF-2-1 Key-words: MET Technician Cl. 3 ProfE-Bases 2 years Annual Africaans,E 1995

Course Title: *National Diploma (Meteorology)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General Meteorology; Introduction to dynamic and physical Meteorology; Instruments and Methods of observation; Meteorological codes; Climatology; Statistical Methods in Climatology; Mathematics; Physics; Electronics; Computer Skills.

Entry: Senior/matriculation certificate.

ZAF-3	South Africa Weather Bureau	TEL: (27-12) 290-2930
Contact	S.A. Weather Bureau	FAX: (27-12) 290-3031
Address:	Private Bag X97 PRETORIA 0001 South Africa	E-M/tlx:

ZAF-3-1 Key-words: MET Observation Cl. 4 ProfF-Instr 1 year Annual Africaans,E 1995

Course Title: *Course for weather observers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Course Syllabus is based on WMO-No. 258 for Class IV and Class III. General meteorology; Surface

observations and instruments; Upper air observations; Cloud observations; Radiation; Electronic weather observation systems; Automatic weather stations; Inspection of weather stations; Quality control of data.

The course is presented as a correspondence course for the observers at the out-stations.

Entry: Senior/matriculation certificate.

SUDAN, The Republic of the

SDN-1	University of Khartoum	TEL:	(249-11) 778 837
	Institute of Environment Studies		
Contact	The Director of Training and Research	FAX:	(249-11) 771 693
Address:	Meteorological Department		
	P.O. Box 574; KHARTOUM, Sudan	E-M/tlx:	23088 GVMEN SD
	CC: University of Khartoum		

SDN-1-1	Key-words:	MET	PredictForec	Cl. 1a-1b	ProfS-Synop	1-2 years	Annual	English	1995
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Course Title: *Postgraduate Diploma and M.Sc. in Meteorology*

Course Syllabus and Additional Information (c.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

COMPULSORY COURSES: Physical Meteorology; Dynamic Meteorology; Synoptic Meteorology; Statistics and Computer use; Contemporary Meteorology Problems.

OPTIONAL COURSES: Aeronautical Meteorology; Satellite and Radar Meteorology; Numerical Weather Prediction; Physics and Mathematics (Level A); Tropical Meteorology; Meteorological Instruments and Methods of Observation; Climatology.

For Diploma and part of M.Sc., candidates are required to take all the compulsory courses plus one group of the optional courses. Study fees: for the Diploma US\$ 5,000.00; for the M.Sc. US\$ 10,000.00. For accommodation and boarding, US\$ 500.00 per month is sufficient.

Entry: B.Sc. in General Science (Mathematics and/or Physics).

SWEDEN, The Kingdom of

SWE-1 Swedish Meteorological and Hydrological Institute TEL: (46-11) 158 000
 Contact Permanent Representative with WMO FAX: (46-11) 170 207
 Address: Swedish Meteorological and Hydrological Institute E-M/tlx: Name@SMHI.SC.
 Folkborgsvägen 1
 S-601 76 NORRKOPING, Sweden

SWE-1-1 Key-words: MET Observation Cl. 4 ProfF-Abini 1 week Ad hoc Swedish 1995

Course Title: *Initial Training for Meteorological Observers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Observation techniques; coding; review of national instructions and cloud atlas.

The students are employed by SMHI. No tuition fees.

Entry: About one year's practice as observer (after 1-2 days initial instruction at station by meteorologist).

SWE-1-2 Key-words: MET PredictForec Cl. 1-2 ProfS-Rfrsh 1 week Biannual Swedish 1995

Course Title: *Refresher course for professional meteorologists (primarily forecasters)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Emphasis on new or rapidly developing branches of meteorology such as numerical analysis and forecasting, statistical methods, use of satellite and radar data; mesoscale meteorology; general information on important ventures in international meteorology; information on meteorological applications and their use.

Entry: 5-7 years' work at National Meteorological Service as professional meteorologist.

SWE-1-3 Key-words: MET Technician Cl. 3 ProfS-Rfrsh 2 weeks Ad hoc Swedish 1995

Course Title: *Refresher course for assistants (Class III)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Synoptic and aeronautical meteorology; codes; new instruments; observations.

Entry: 5-10 years' work as meteorological assistant.

SWE-1-4 Key-words: HYD Clhymet Cl. 1b ProfS-Rfrsh 1 week Ad hoc Swedish 1995

Course Title: *Refresher course for professional hydrologists*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Information and presentation of research and developments in related subjects; society's use of hydrological information.

Students are employed at SMHI.

No tuition fees.

Entry:

SWE-1-5 Key-words: HYD Operational Cl. 1b ProfS-Intnl 1-2 months Ad hoc Swedish,E 1995

Course Title: *Training course for application of a runoff model to river systems and river basins*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

A conceptual runoff model put into practice predicting the actual or worst possible situation. SMHI can provide a model as an engineering tool, e.g. streamflow forecasting and flood warning system, water resources assessment and water balance studies.

Required national/international travel expenses and subsistence allowance in Sweden will also be reimbursed. Financial aid can be bayed, for projects with an on-the-job training.

Entry: Postgraduate level, engineers, hydrologists.

SWE-1-6 Key-words: MET Operational Cl. 1b ProfS-Intnl Flexible Ad hoc Swedish 1995

Course Title: *OJT and/or guidance of individual work*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):
 This training is available only for a very restricted number of foreign visitors or fellows.
 Entry:

SWE-2 Stockholm and Uppsala Universities
 Contact Stockholm University
 Address: Department of Meteorology, Arrheniuslaboratoriet
 S-106 91 STOCKHOLM, Sweden
 CC. University of Uppsala

TEL: (+46) 816-2395
 FAX: (+46) 815-7185
 E-M/tlx: kursinfo@misu.su.se

SWE-2-1 Key-words: MET Operational Cl. 1a UnivF-Bases 1.5 years Annual Swedish,E 1995

Course Title: *Academic course for professional meteorologists (roughly equivalent to B.Sc.)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Atmospheric Composition; Radiation; Thermodynamics; Cloud Physics; Dynamic Meteorology; Atmospheric Boundary Layer; Synoptic Meteorology; Climatology; Meteorological Instruments and Methods of Observation; Atmospheric Chemistry; Mesoscale Meteorology; Numerical Methods in Meteorology; Degree Project (10 p).

Course at SMHI during two months, before employment as meteorologist. A credit of 40 p corresponds to one year of full-time studies. One university year consists of two semesters: 15 January - end of May and September - 15 January. Address for further information: Head of Department, Institute of Meteorology, University of Uppsala, Box 516, S-751 20 UPPSALA 1, Sweden.

Entry: 80 p of university studies in physics and mathematics.

SWE-2-2 Key-words: MET Scientific Cl. 1b-1c UnivF-R&D 1.5 years Annual Swedish 1995

Course Title: *Academic course as a basis for higher degree studies and research in meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Syllabus is the same as the first 60 p in the Academic course for professional meteorologists (see Course SWE-2-1). In addition: electromagnetic radiation; photo-chemistry; and an individual specialization in a meteorological field.

Studies for Ph.D. in meteorology could start after 60 p in the basic courses. A credit of 40 p corresponds to one year of full-time studies. One university year consists of two semesters: 15 January - end of May and September - 15 January. See also further information under Course SWE-2-1.

Entry: 80 p of university studies in physics and mathematics.

SWE-2-3 Key-words: MET Scientific Cl. 1c UnivS-Rsrch Flexible Ad hoc Swedish 1995

Course Title: *Higher academic degree (Ph.D.) in meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNIVERSITY of STOCKHOLM emphasis on: Dynamic Meteorology; Atmospheric Chemistry; Radiation and Optics; Photo-chemistry; Turbulence and Diffusion; General Circulation; Mesoscale Meteorology; UNIVERSITY of UPPSALA, emphasis on: Atmospheric Turbulence and Diffusion; Atmospheric Electricity and Radioactivity; Mesoscale Meteorology.

No tuition fees.

Entry: Basic academic course or academic course for professional meteorologists.

SWE-2-4 Key-words: MET Scientific Cl. 1a UnivE-IDisc 6 months Biennial Swedish 1995

Course Title: *Degree studies for non-meteorologists - emphasis on Atmospheric Physics*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction to Meteorology (5 p); Climatology (5 p); Atmospheric Chemistry and Air Pollution (5 p); Radiation, Cloud Physics and Precipitation Processes (5 p).

Course delivered jointly by University of Stockholm and University of Uppsala. 40 p corresponds to one year of full-time studies. One university year consists of two semesters: 15 January - end of May; and September - 15 January.

Entry: Complete secondary education, science branch.

SWE-2-5 Key-words: MET Scientific Cl. 1a UnivE-IDisc 1 year Ad hoc Swedish 1995

Course Title: *Degree studies for non-meteorologists - emphasis on Synoptic Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Meteorology introductory course (5p); Meteorological aspects of Climate and Climate Variations (5p); Air Chemistry and Air Pollution Meteorology (5p); Synoptic Meteorology and Weather Analysis (5p).

40 p correspond to one year of full-time studies.

Entry: Complete secondary education; science branch.

SWE-2-6 Key-words: MET Scientific Cl. 1a-1b UnivS-Advan 10 weeks Annual Swedish 1995

Course Title: *Meteorology Specialized Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Dynamic Meteorology - Basic Equations for Weather Forecasting; Theory behind Parameterization of Physical Processes in Weather Forecasting Models; Data Assimilation for Numerical Weather Prediction.

40 p corresponds to one year of full-time studies.

Entry: 80 p of university studies in mathematics and physics; and 60 p of university studies in meteorology.

SWE-2-7 Key-words: MET Scientific Cl. 1a-1b UnivF-Chemi 10 weeks Annual Swedish 1995

Course Title: *Air Chemistry*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Thermodynamic and Hydrodynamic Processes in the Atmosphere; The Chemical Composition of the Atmosphere; Chemical Reactions in the Atmosphere; Gas Phase and Liquid Phase; The Cycles of Sulfur, Nitrogen, Carbon Dioxide, Ozone, etc.; Air Pollution Meteorology; Interaction between Gases and Aerosols in the Atmosphere.

40 p corresponds to one year of full-time studies.

Entry: 40 p of university studies in chemistry; and 10 p of university studies in mathematics.

SYR-1 Meteorological School, Damascus

Contact: The Director-General, Meteorological Department
 Address: Ministry of Defense
 Mazzeh Jabal, P.O. Box 4211
 DAMASCUS - Syrian Arab Republic

TEL: (963-11) 662-4352
 FAX: (963-11) 662-0553
 E-Mail: 41.32.04 ARSAD SY

SYR-1-1 Key-words: MET AssistForec Cl.2 ProfE-Bases 24 months Ad hoc Arabic 1998

Course Title: *Assistant forecaster's course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Mathematics; physics; climatology; dynamic and synoptic meteorology; forecasting; training in addition to short course in observations.

A background knowledge in mathematics and physics is necessary to work in the different sections of the Department under the supervision of the graduate personnel. Applications for admission of any foreign students are subject to approval by the authority concerned.

Entry: Science branch "Secondary Certificate".

SYR-1-2 Key-words: MET Observation Cl.3 ProfE-Bases 11 months Ad hoc Arabic 1998

Course Title: *Upper Air Observations*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Meteorological Instruments; Elementary Meteorology; Synoptic Codes; Weather Observation; Mathematics; Statistics; Physics; Radiosonde Equipment; Calculation of Pilot Balloon Data; Operational Aspects of Ground Equipment; English Language; On-the-job Training.

Applications for admission of any foreign students are subject to approval by the authority concerned

Entry: Secondary School Certificate, Science branch.

SYR-1-3 Key-words: MET Observation Cl.4 ProfE-Bases 7 months Ad hoc Arabic 1998

Course Title: *Surface Observer*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Elementary Meteorology; Meteorological Instruments; synoptic Codes; Making and Recording of Weather Observations; Decoding and Plotting; Statistics and Controlling of Climatological Data; Elements of Agrometeorology; Agrometeorological Observations; English Language.

Applications for admission of any foreign students are subject to approval by the authority concerned.

Entry: Intermediate School Certificate.

TANZANIA, The United Republic of

TZA--1	National Meteorological Training School Kigoma	TEL: (255-51) 26 231
Contact	The Director General	FAX: (255-51) 20 881
Address:	Directorate of Meteorology	E-M/tix: 414.42 HEWA
	P.O. Box 72197,	
	DAR ES SALAAM, Tanzania	

TZA-1-1 Key-words: MET Observation Cl.4 Proff-Bases 12 months Biannual English 1988

Course Title: *Course on Training of Meteorological Personnel Class IV*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Selected topics in earth science; meteorological instruments and methods of observation; coding and plotting of synoptic charts; agrometeorology; pilot balloon observation; climatological data compilation; preparation of meteorological diagrams and intense practical simulation in a mock observatory.

Tuition fees to be announced.

Entry: 'O' Level certificate with good passes in mathematics and physics.

TZA-1-2 Key-words: MET Observation Cl.3 Proff-Bases 40 weeks Annual English 1988

Course Title: *Training of Meteorological Personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Mathematics; physics; general meteorology; meteorological instruments; agrometeorology; pilot balloon and radiosonde observation; aeronautical meteorology; meteorological codes.

Tuition fees at Government expense.

Entry: Must have passed the Class IV meteorological personnel course and with working experience of at least two years in the field of meteorology.

TZA-1-3 Key-words: MET Observation Cl.3-4 Proff-Instr 10 weeks Ad hoc English 1988

Course Title: *Sandwich course for training of meteorological and agrometeorological instrument users*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Relevant topics in general meteorology, agrometeorology, use, care and maintenance of meteorological instruments, methods of meteorological data compilation.

Entry: Variable.

THAILAND, The Kingdom of

THA-1	Meteorological Department, Bangkok	TEL:	(662) 258-0437
Contact	The Director-General Meteorological Department	FAX:	(662) 399-4014
Address:	Ministry of Transport and Communications 4353 Sukumvit Road, Bang Na, Phrakonong BANGKOK 10260, Thailand	E-M/tx:	720.04 MET BK TH

THA-1-1 Key-words: MET Operational Cl.2 ProfF-Bases 6 months Ad hoc Thai 1995

Course Title: *Training of Class II meteorologists*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General meteorology; dynamic meteorology; tropical meteorology; meteorological instruments; synoptic meteorology; synoptic laboratory; aeronautical meteorology; climatology; agricultural meteorology; operational hydrology.

Each course can accommodate about 10-25 students. No tuition fees.

Entry: B.Sc. degree in physics and mathematics or other related fields which provide sufficient knowledge of physics and mathematics.

THA-1-2 Key-words: MET Observation Cl.4 ProfF-Bases 12 months Ad hoc Thai 1995

Course Title: *Training of meteorological observers (Class IV)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Practically all basic subjects are taught. Among these are: mathematics, physics, meteorological subjects, English, civil service rules and regulations, humanities, laboratory and field work, meteorological instruments and observations.

No tuition fees.

Entry: High school graduate or equivalent with aptitude in mathematics and physics.

TURKEY, The Republic of

TUR-1	Anatolia Meteorological High School	TEL: (90-312) 314-1616
Contact	Permanent Representative with WMO	FAX: (90-312) 359-3430
Address:	Turkish State Meteorological Service Anatolia Meteorological High School P.O. Box 401, ANKARA, Turkey	E-M/tlx: 444.02 ANKM TR

TUR-1-1 Key-words: MET Operational Cl. 1a ProfE-Varia 4 years Annual Turkish,E 1995

Course Title: *Meteorology course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Theoretical meteorology, meteorological instruments, observations, coding and decoding, plotting of surface and upper-air charts, forecasting, climatology and hydrology. Besides these, the students of Anatolia Meteorological High School take other cultural lessons such as physics, mathematics, chemistry, etc. at elementary level.

Boarding at the school. No tuition fees.

Entry: After succeeding secondary school.

TUR-2	Istanbul Technical University	TEL: (90-212) 285-3030
Contact	Istanbul Technical University	FAX:
Address:	Faculty of Aircraft and Space Science Meteorological Engineering Department AYAZAGA, Istanbul	E-M/tlx:

TUR-2-1 Key-words: MET Scientific Cl. 1b ProfE-IDisc Flexible Annual Turkish 1995

Course Title: *Training of Class I meteorological personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Lectures, exercises in advanced mathematics; theoretical physics; general meteorology; theoretical meteorology; synoptic meteorology; climatology; meteorological instruments.

No tuition fees.

Entry: After succeeding High School and passing the University entrance examination.

TUR-3	Turkish State Meteorological Service	TEL: (90-312) 314-1616
Contact	Permanent Representative with WMO	FAX: (90-312) 359-3430
Address:	Turkish State Meteorological Service Anatolia Meteorological High School P.O. Box 401, ANKARA, Turkey	E-M/tlx: 444.02 ANKM TR

TUR-3-1 Key-words: MET Observation Cl. 3-4 ProfF-Bases 12-16 weeks Ad hoc Turkish 1995

Course Title: *Basic training of observers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Climatology, synoptic meteorology, meteorological instruments, practical exercises.

No possibilities of accepting students from other countries (except Turkish-speaking countries).

Entry: Secondary school education.

TUR-3-2 Key-words: MET PredictForec Cl. 1b ProfF-Bases 16-20 weeks Ad hoc Turkish 1995

Course Title: *Basis forecasting course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Dynamic meteorology; atmospheric motions; physical meteorology; aeronautical meteorology; synoptic meteorology; climatology; analysis and forecasting; laboratory; meteorological telecommunication; statistics; satellite image interpretation.

No possibilities of accepting students from other countries (except Turkish-speaking countries).

Entry: University degree in basic sciences is required.

TUR--3--3 Key-words: MET InstrumEquip Cl. 1b ProfF-DataP 6-8 weeks Ad hoc Turkish 1995

Course Title: *Data processing*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Quality control, drawing and plotting, meteorological database, NWP, modelling.

No possibilities of accepting students from other countries (except Turkish-speaking countries).

Entry: University degree in basic sciences is required.

TUR--3--4 Key-words: MET InstrumEquip Cl. 1b ProfF-Marin 8-10 weeks Ad hoc Turkish 1995

Course Title: *Marine Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Wave forecasting, sea observation, sea water temperature.

No possibilities of accepting students from other countries (except Turkish-speaking countries).

Entry: University degree in basic sciences is required.

TUR--3--5 Key-words: MET InstrumEquip Cl. 1b ProfF-Telec 4-6 weeks Ad hoc Turkish 1995

Course Title: *Meteorological Telecommunication*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Message handling, quality control.

No possibilities of accepting students from other countries (except Turkish-speaking countries).

Entry: University degree in basic sciences is required.

TUR--3--6 Key-words: MET InstrumEquip Cl. 1b ProfF-Bases 8-10 weeks Ad hoc Turkish 1995

Course Title: *Electronic Instruments and Hardware*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Maintenance and service.

No possibilities of accepting students from other countries (except Turkish-speaking countries).

Entry: University degree in basic sciences is required.

UNITED ARAB EMIRATES, The

ARE-1 **Dubai Aviation College**
Contact: Principal
Address: Dubai Aviation College
 P.O. Box 53044
 DUBAI, United Arab Emirates

TEL: (971-2) 241 000
FAX: (971-2) 241 222
E-M/tlx: 46633 DUBAC EM

ARE-1-1 Key-words: MET AssistForec Cl.2 ProfF-Bases 1 year Annual English 1991

Course Title: *Training of Class II Meteorological Personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Introduction to National Coding and Observing Procedures; Physical and Dynamical Meteorology to Class II level; Synoptic Meteorology, including theory, and extensive Analysis and Forecasting Practise; Aviation Meteorology; Numerical Modelling; Satellite Image Interpretation; General Climatology and Introduction to Statistics in Meteorology; Tropical Meteorology.

Frequency: Open course for individuals - 1 per annum. Closed course - starting date as requested by Client. Tuition fees information - on request.

Entry: Students must be fluent in English language and must have an equivalent United Kingdom General Certificate of Education Advanced Level in mathematics and physical science.

ARE-1-2 Key-words: MET Technician Cl.3 ProfF-Bases 39 weeks Annual English 1991

Course Title: *Training of Class III Meteorological Personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Elementary Dynamic and Physical Meteorology; Introduction to Synoptic and Tropical Meteorology; Special requirements for aviation; Introduction to Satellite Systems and Images; Basic Climatology; Meteorological Instruments and Observation Procedures.

For further information see Course ARE-1-1.

Entry: English language fluency and sound knowledge of mathematics and physical science.

ARE-1-3 Key-words: MET Observation Cl.4 ProfF-Bases 16 weeks Annual English 1991

Course Title: *Training of Class IV Meteorological Personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Essentially practical in approach, the course is balanced by: An introduction to theoretical aspects of meteorology; Measurements and Recording of Meteorological Parameters; Coding; Elementary Physical and Synoptic Meteorology; Basic Operation and Care of Instruments.

For further information see Course ARE-1-1.

Entry: English language fluency and sound knowledge of mathematics and physical science.

UNITED KINGDOM of Great Britain and Northern Ireland

GBR--1 The Meteorological Office College

TEL: (44-1344) 855 205

Contact The Meteorological Office College

FAX: (44-1344) 855 410

Address: Shinfield Park
READING, RG2 9AU
Berkshire, United Kingdom

E-M/tx: RWRiddaway@email.meto.govt.uk

GBR-1-1 Key-words: MET Scientific Cl.1b Proff-Advan 15 weeks Annual English 1995

Course Title: *Meteorology for Graduates*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PART I (8 weeks). OBSERVATIONAL METEOROLOGY: weather observing; meteorological reports; interpretation of observations from ships, aircraft and radiosondes. PHYSICAL AND SYNOPTIC METEOROLOGY: global characteristics of the atmosphere; synoptic scale weather systems including air masses, fronts and surface and upper-level systems; radiative processes and the transfer of heat and moisture in the boundary layer; the development of convection and associated weather phenomena; basic cloud and fog physics; introduction to tropical meteorology, oceanography and hydrology; an introduction to the forecast process, including chart analysis. DYNAMICS AND THERMO-DYNAMICS: forces acting on the atmosphere; geostrophic and gradient winds and the effects of friction; equation of state and laws of thermodynamics; water and phase changes; adiabatic processes; the tephigram; thickness and thermal winds; importance of vertical motion. REMOTE SENSING AND NUMERICAL MODELS: satellites and interpretation of cloud imagery; weather radars; an introduction to numerical modelling; the current Meteorological Office operational forecast models; elementary interpretation of NWP products. PRESENTATION SKILLS: presentational skills are developed throughout the course with each student being required to undertake weather briefings and make short presentations. CURRENT WEATHER: the course concludes with a week of practice using real-time weather data.

PART II (8 weeks). This training is designed for staff who have successfully completed Part I, and who will be working in a meteorological research department. METEOROLOGICAL DYNAMICS: the full equations of atmospheric motion; ageostrophic and vertical motion; divergence and vorticity; the vorticity equation; potential vorticity; quasi-geostrophic approximations; methods of assessing development; the Omega equation; wave motions in the atmosphere including acoustic, gravity, Rossby and equatorial waves. PHYSICAL METEOROLOGY: theoretical aspects of radiation and cloud physics; the stratosphere and mesosphere. REMOTE SENSING: radiative transfer equation and satellite sounding theory; applications of multi-spectral imagery; the ERS1 and UARS satellite programmes. NUMERICAL MODELING: equations used by forecasting models; finite difference and spectral techniques; data assimilation methods; parametrisation; predictability and growth of errors; evaluation of numerical forecasts. PROJECT WORK: each student will be required to undertake a literature review on an agreed subject; findings will be presented orally and a short written report submitted. RESEARCH ACTIVITIES OF THE MET. OFFICE: scientific background to the work of the Atmospheric Processes Research, Climate Research and Forecasting Research Divisions; specific activities of the Research Divisions.

OUTSTATION EXPERIENCE (2 weeks): At the end of Part II overseas students may wish to undertake an extra two-week training period to gain work experience in an operational forecast office. Students taking up this option are detached to a Meteorological Office or Weather Centre (away from Reading) to apply the techniques learned during Parts I & II.

The course is Residential.

Entry: A good University degree in mathematics or physics or an equivalent qualification.

GBR-1-2 Key-words: MET PredictForec Cl.1b-2 Proff-Abini 20 weeks Annual English 1995

Course Title: *Initial Forecasting*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PART I. METEOROLOGICAL OBSERVING: making, coding and plotting surface observations in the SYNOP and METAR codes; upper-air codes and the tephigram. BASIC METEOROLOGY: climate of the British Isles; water in the atmosphere; introduction to air masses and fronts, interpreting weather maps, chart analysis techniques; weather satellites and weather forecasting.

PART II. PHYSICAL AND SYNOPTIC METEOROLOGY: global characteristics of the atmosphere; temperate latitude synoptic-scale weather systems: air masses, fronts, surface and upper-level systems and jet streams; radiation, convection and associated weather phenomena; mesoscale weather effects; an introduction to tropical meteorology and climatology; interpretation of weather radar and satellite imagery. METEOROLOGICAL DYNAMICS AND THERMODYNAMICS: equations of motion,

geostrophic and gradient winds, temperature, thickness and thermal winds; development of weather systems and the relationship with divergence and ageostrophic motion; an introduction to vorticity and thermal advection; friction, turbulence and energy fluxes in the boundary layer; dry air thermodynamics, adiabatic processes, thermodynamic diagrams, the tephigram; physics of water and phase changes; static stability; cloud physics and precipitation processes. OPERATIONAL WEATHER FORECASTING: analysis of surface and upper-air observations; numerical weather prediction and the Meteorological Office operational forecast models; interpretation and use of numerical forecast products; short-term subjective forecasting techniques; specific techniques for local forecasts of wind, temperature, fog formation and dispersal, clouds, precipitation and aviation hazards; forecasting wind, waves and swell for offshore operations; preparation of aviation forecasts with training in briefing techniques; preparation of forecasts for the media, commercial customers and the public, with training in TV and radio presentation and scriptwriting; probability forecasting and forecast verification; use of word processors; telephone skills. CURRENT WEATHER TRAINING: observing, forecasting and presentation practice appropriate to the individual's future forecasting duties, using real-time data.

The course is Residential.

Entry: A standard of mathematics and physics equivalent to that attained by one year of study at a university for a degree in a physical science.

GBR-1-3 Key-words: MET PredictForec Cl.1b ProfS-Speci 6 weeks Ad hoc English 1995

Course Title: *Advanced Forecasting*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

CONTENT: Empirical and dynamical methods of defining macro-, meso- and micro-scale. Revision of cloud physics, physics of stratocumulus and fog formation, boundary layer theory, fundamental thermodynamic, and Sutcliffe's equation. Use of Omega and Q-vector equations developed from the temperature and vorticity equations. Potential vorticity on isentropic surfaces as a diagnostic tool. The role of gravity waves and turbulence in energy distribution. Topographically induced air flow and an update on the effects of mountains on atmospheric airflow. Application of theory to the current weather in terms of conceptual models. Application of conceptual models to satellite imagery to determine the state of the atmosphere. Design and use of verification techniques. Providing feedback and managing stress and time. Use of personal review procedures. Techniques for dealing with people from the media and media interviews.

The prime strength of the course is in the understanding of the atmosphere and of the guidance issued by the UK Met. Office Central Forecast Office. The course aims are: (a) to enable forecasters to operate independently of supervision and to improve the accuracy of their forecasts; the various practical case studies/current weather used are based on British Isles and Western Europe temperate latitude weather patterns; (b) to enable forecasters to deal effectively with people in the workplace, which requires much more emphasis to be put on teamwork; these team-building components of the course are accepted by UK Met. Office management as important skills.

By the end of the course participants will be able to: (i) demonstrate an improved understanding of conceptual models, numerical models, remote sensing techniques and their products; (ii) develop and use verification techniques to improve their own and others' forecasts; (iii) apply their understanding in an operational environment; (iv) relate to individuals - work in groups, with other organisations and customers; (v) handle the media competently; (vi) understand and operate the Met. Office personal review procedures. The course is Residential.

Entry: A standard of mathematics and physics equivalent to that attained by one year of study at a university for a degree in a physical science and able to operate effectively within full range of duties expected within post.

GBR-1-4 Key-words: MET PredictForec Cl.1b ProfS-Rfrsh 2 weeks Ad hoc English 1995

Course Title: *Extension*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

METEOROLOGICAL DYNAMICS AND THERMODYNAMICS: a brief revision of fundamental dynamics and thermodynamics including radiation. OPERATIONAL METEOROLOGY: a limited view of numerical weather prediction and the Meteorological Office operational forecast models; limited interpretation and use of numerical forecast products; probability forecasting and forecast verification; use of word processors and PC-based systems. SELF IMPROVEMENT: time management; feedback skills and practice; presentation skills; leadership skills. INVESTIGATIONAL TECHNIQUES: simple statistical analysis techniques useful for meteorology; report writing; a simple field experiment with written report and presentation will be used to practice the acquired skills.

In addition to the basic requirement stated under the item on entrance qualification, each participant must have completed the Applied Meteorology or Advanced Forecasting Course (or an equivalent NMS course) and have work experience in the field of applied meteorology over a minimum period of eight years or five years respectively. Non-residential option.

Entry: A standard of mathematics and physics equivalent to that attained by one year of study at a University for a degree in a physical science.

GBR-1-5 Key-words: MET Scientific Cl. 1b-2 ProfS-SateM 1 week Ad hoc English 1995

Course Title: *Remote Sensing*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

RADIATION THEORY, including Planck's, Wein's, Stefan's, Beer's, Kirchhoff's laws; albedo, transmissivity, absorbtivity, scattering theory; the radiative transfer equation and the principles of temperature and humidity sounding of the atmosphere, including water vapour channel interpretation and current and future instruments. POLAR ORBITING AND GEOSTATIONARY SATELLITES: the AVHRR instrument and the characteristics of its imagery; basic interpretation of visible and thermal infra-red imagery; more advanced imagery interpretation, including fronts, jets, cyclogenesis; METEOSAT, including its products, current status and future plans; ERS and UARS, together with planned new systems, including the European Polar Orbiting Systems; using satellite data and model fields superimposed, including Potential Vorticity fields and water vapour imagery; wider application of meteorological satellite data in hydrology, oceanography and agriculture. PRINCIPALS OF WEATHER RADAR, including Doppler; the UK weather radar network and its processing, including FRONTIERS and NIMROD; newer conceptual models of precipitation systems in the light of radar and satellite imagery.

Non-residential option.

Entry: The course is available to operational and research meteorologists who have attend either a meteorological course for graduates or a forecasting course and have at least four years' specialist experience.

GBR-1-6 Key-words: MET Scientific Cl. 1b-2 ProfS-DynaM 1 week Ad hoc English 1995

Course Title: *Numerical Weather Prediction Appreciation*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

BASIC PRINCIPLES AND METHODOLOGY OF NWP; importance of resolution. STRUCTURE OF THE UNIFIED MODEL: dynamic and thermodynamic foundations; global, limited area and mesoscale models - domains, resolutions and schedules; data quality control and assimilation; parametrisation of unresolved physical processes. UNIFIED MODEL PRODUCTS and their interpretation. PREDICTABILITY AND ENSAMBLE MODELING; the ECMWF model. EXERCISES illustrating principles covered in the lectures. LECTURES by experienced NWP users and researchers on subjects of current interest.

The course is part of the continuation training of a forecaster; normally a participant will have attended an Advanced Forecasting Course (AFC), but not in the previous three years. Non-residential option.

Entry: The course is aimed at experienced weather forecasters who require an improved general appreciation of numerical weather prediction (NWP) models and, in particular, information about the current structure and status of the NWP models used by the Meteorological Office.

GBR-1-7 Key-words: MET Operational Cl. 2-4 ProfS-Rfrsh 2 weeks Ad hoc English 1995

Course Title: *Meteorological Refresher*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PART 1 (5 days): Each day will consist of a mixture of presentations or learning activities followed by associated group exercises to practice skills and reinforce new knowledge. The subjects covered will include air masses and fronts, clouds physics, convection and thunderstorms, using the tephigram, surface and upper wind. The exercises will be based around case studies to practice particular skills such as surface chart analysis, upper-air chart and tephigram analysis.

PART 2 (5 days): Each day comprises a series of morning presentations followed by afternoon sessions devoted to analysis of current weather. Subjects covered will include: Introduction to the Global and Limited Area Models, using model products, using satellite and radar imagery, and the latest conceptual model methods of analysis. The real-time afternoon sessions will utilise the latest operational equipment and techniques to create a detailed understanding of the day's weather. The instructors will lead an end of day discussion, particularly considering the forecasting aspects of the prevailing situation.

The course is appropriate for operational personnel, administrators, support and commercial staff. Non-residential option.

Entry: The course is intended for staff who have completed a meteorological observing course and who have at least five years' experience.

GBR-1-8 Key-words: MET Technician Cl.3-4 ProfS-Instr 16 weeks Biennial English 1995

Course Title: *Instrument Maintenance Course for Meteorological Personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PART 1 (8 weeks at The Farnborough College of Technology): BASIC MATHEMATICS: Decimals, fractions, logarithms, tables, formulae, transposition, basic trigonometry, forces, moments, areas, volumes. WORKSHOP TECHNOLOGY: General safety, nuts, bolts, screws, thread forms, micrometers, verniers, drilling machines, grinding machines, lathes. FABRICATION & WELDING TECHNOLOGY: Workshop safety, sheet metal joints, riveted joints, wired edges, soft soldering, hard soldering, oxy-fuel welding equipment. WORKSHOP PRACTICAL EXERCISES: Straight edge, drilled plate, cold chisel, pin punches, centre punch, plumb bob, plum bob cap, screwdriver, toolmaker's clamp, tap wrench, vee block. FABRICATION WORKSHOP PRACTICE: Fabrication, various joint types, production, hinge production. Practical end test incorporating welding, brazing, machining and sheet metal work. ENGINEERING DRAWING AND DEVELOPMENT: Plane geometry, orthographic projection, dimensioning, drawing symbols, general assembly drawings, parallel lines, radial line, triangulation.

PART 2 (8 weeks at The Meteorological Office College): THEORY OF METEOROLOGICAL INSTRUMENTS: instrument exposure and siting, design, and deployment of enclosures, general principles governing the design and construction of instruments. Meteorological use of observations. MECHANICAL METEOROLOGICAL INSTRUMENTS: the installation, calibration and maintenance of instruments used for the measurement of: atmospheric pressure, temperature, humidity, surface wind, upper winds, precipitation, cloud base, sunshine duration, radiation. BASIC ELECTRICITY: simple circuit theory, Ohm's law, current, charge, voltage, resistance, power, energy, series and parallel connection of resistors, shunts, multipliers, sources of electricity, direct and alternating current, transformers, motors and generators; the identification and use of components. TECHNICAL AWARENESS: safe working practices, use of electrical tools, hazardous substances, electrical safety, use of ropes and knots, safety belts and harnesses; additional safety clothing, tower climbing, ladders and masts, essential first aid, fire precautions and kinetics. TEST EQUIPMENT: the design, construction, basic accuracy and calibration of simple test instruments: analogue and digital multimeters, Wheatstone bridge, insulation testers, mains indicators, bench power supplies, variacs and decade resistance boxes. PROJECT CONSTRUCTION: the design and construction of a simple voltmeter and calibration unit for the diagnosis of simple faults on electro-mechanical instruments. ELECTRO-MECHANICAL INSTRUMENTS: the design, construction, installation, calibration and repair of: Desynn and magstrip based wind systems, tipping-bucket raingauges, electrical resistance thermometers; instruments based upon the use of thermo-couples and thermistors. ELECTRONIC INSTRUMENTS: daily user maintenance requirements for electronic based instruments and systems; first line maintenance using available resources and expertise: the need for power down in the event of a fault, equipment supply requirements, the construction and repair of standard mains and signal connectors; replacement of ribbons, writing edges, paper and fuses. VISITS: visits are arranged to relevant instrument manufacturers and to other Meteorological Office instrument and calibration departments.

The basic education requirement, stated under the item on entrance qualification, may be relaxed if evidence of suitable acquired experience in mathematics and physics (including elementary electricity) is substituted. It is essential that students have a good standard in writing, speaking and understanding English. Fees are published as a supplement when each course is announced. The fees include: tuition at both Colleges; all food and accommodation at the Meteorological Office at Shinfield Park (please note that the cost of food and accommodation for Part 1 of the course at Farnborough will be the responsibility of the student); necessary transport between the two Colleges and on any visits which form part of the course; safety clothing, a continuity tester and the loan of drawing instruments. Part 1: non- residential; Part 2 : residential.

Entry: The standard of education required in the final examination on leaving secondary (or high) school and either 1-2 years experience as a meteorological observer or industrial experience in electrical or light engineering for a similar period.

GBR-2 University of Reading

TEL: (44-1734) 318 954

Contact: University of Reading

FAX: (44-1734) 352 604

Address: Department of Meteorology
2 Earley Gate, READING, RG6 6AU
Berkshire, United Kingdom

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GBR-2-1 Key-words: MET Scientific Cl.1a UnivE-Atmos 3-4 years Annual English 1995

Course Title: *B.Sc. in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PART 1 (two ten-week terms): Introduction to Meteorology - atmosphere, oceans and climate; Synoptic Meteorology; Physical Meteorology - measuring the atmosphere. Selected units in physics, mathematics and earth science.

PART 2 (three ten-week terms): Basic fluid dynamics, atmospheric dynamics, surface energy exchange, general circulation, computing and numerical methods, radiative transfer, cloud physics, statistical climatology, atmospheric chemistry, hydrology. Selected optional units in mathematics, physics, earth science, foreign language.

PART 3 (three ten-week terms): Mid-latitude dynamics (theory and practical), tropical dynamics (theory and practical), physical oceanography, dynamical oceanography, atmospheric analogues laboratory, remote sensing, satellite meteorology, micro-meteorology, boundary layer meteorology, numerical weather prediction, meteorological project, weather studies.

The course aims to provide a scientific training suitable for students intending to pursue or develop a career in meteorology or closely related environmental science. The four-year study programme includes a one-year Preparatory course in Science and Mathematics for B.Sc. candidates without 'A' levels (or equivalent) in Mathematics and Physics. Course fees (1995/96): £1,600 (three-year course); £5,840 (Preparatory course four years); plus evidence of about £5,200 for living expenses.

Entry: GCSE 'A' level or equivalent in physics and mathematics and one other subject (three-year course).
GCSE 'O' level science and mathematics plus WMO Class II (four-year course).

GBR-2-2 Key-words: MET Scientific Cl.1a UnivE-Atmos 3 years Annual English 1995

Course Title: *B.Sc. in Physics and Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PART 1 (two ten-week terms): Introduction to Meteorology - atmosphere, oceans and climate; Synoptic Meteorology; Physical Meteorology - measuring the atmosphere. Units in physics and mathematics.

PART 2 (three ten-week terms): Basic fluid dynamics, atmospheric dynamics, surface energy exchange, general circulation, computing and numerical methods, radiative transfer, cloud physics. An equal number of units in physics are also taken.

PART 3 (three ten-week terms): Meteorological project, physical oceanography, weather studies, units selected from mid-latitude dynamics (theory and practical), tropical dynamics (theory and practical), dynamical oceanography, atmospheric analogues, laboratory, remote sensing, satellite meteorology, numerical weather prediction, micrometeorology, boundary layer meteorology, hydrology, statistical climatology. An equal number of units in physics are also taken.

The course aims to provide a scientific training suitable for students intending to pursue or develop a career in meteorology or closely related environmental science. Course fees (1995/96) : £1,600; plus living expenses of about £5,200 . A student who successfully completes Part 1 may transfer to B.Sc. Meteorology.

Entry: CGSE 'A' level or equivalent in physics, mathematics and one other subject.

GBR-2-3 Key-words: MET Scientific Cl.1a UnivE-Atmos 3 years Annual English 1995

Course Title: *B.Sc. in Mathematics and Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PART 1 (two ten-week terms): Introduction to Meteorology - atmosphere, oceans and climate; Synoptic Meteorology; Physical Meteorology - measuring the atmosphere. Units in pure and applied mathematics.

PART 2 (three ten-week terms): Basic fluid dynamics, atmospheric dynamics, surface energy exchange, general circulation, computing and numerical methods, radiative transfer, cloud physics. An equal number of units in mathematics are also taken.

PART 3 (three ten-week terms): Meteorological project, physical oceanography, weather studies, units selected from mid-latitude dynamics (theory and practical), tropical dynamics (theory and practical), dynamical oceanography, atmospheric analogues, laboratory, remote sensing, satellite meteorology, hydrology, statistical climatology. An equal number of units in mathematics are also taken.

The course aims to provide a scientific training suitable for students intending to pursue or develop a career in meteorology or closely related environmental science. A student who successfully completes Part 1 may transfer to B.Sc. Meteorology. Course fees (1995/96) : £1,600; plus living expenses of about £5,200.

Entry: GCSE 'A' level or equivalent in three subjects including mathematics.

GBR-2-4 Key-words: MET Scientific Cl.1c UnivS-DynaM 1 year Annual English 1995

Course Title: *M.Sc./Diploma - Weather, Climate and Modelling*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

TOPICS studied include (with some choice of options): atmospheric physics and chemistry, fluid dynamics of the atmosphere, tropical and extratropical weather systems, numerical modelling of the atmosphere, boundary layer meteorology, climate change, global atmospheric circulation, oceanography, remote sensing and hydrometeorology.

The course comprises two 10-week terms of taught modules followed by a four-month period preparing a dissertation. Practical work and computing are included in several modules. Course work, examinations and dissertations contribute to the final mark. The course aims to provide a quantitative description of the physical processes which generate weather systems, of the ways in which weather systems combine to form climates and of the techniques used to simulate weather systems and global climate on computers. A preliminary (ad hoc) period of up to one year is available for candidates whose qualifications fall below the entrance requirements. Course fees (1995/96): £2,430 (students from European Economic Area); £7,840 (students from elsewhere); plus evidence of about £6,000 for living expenses.

Entry: Honours degree in physical science or mathematics, or related subject.

GBR-2-5 Key-words: MET Scientific Cl. 1c UnivS-Atmos 1 year Annual English 1995

Course Title: *Masters in Research (M.Res) in Earth and Atmospheric Science*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

CORE COURSES include: integrated approaches to Earth and Atmospheric Sciences, computing and information skills, advanced techniques, project management, industrial applications. In addition, specialist options given as part of the M.Sc. courses in Weather, Climate and Modelling and in Applied and Agricultural Meteorology are available.

In TERM 3 (May - August) students concentrate on a research topic which includes a literature review and individual research and a fully planned research proposal for future work.

The course aims to provide a thorough training in technical research methods and transferable skills which are required for a career in environmental research. It is run jointly by the University's departments of Meteorology, Sedimentology, Soil Science and Geography. Course work, examination and research project contribute to the final assessment. Course fees (1995/96): £2,430 (students from European Economic Area); £7,840 (students from elsewhere); plus evidence of about £6,000 for living expenses.

Entry: Honours degree in physical science, mathematics or earth science.

GBR-2-6 Key-words: MET Scientific Cl. 1c UnivS-Agric 1 year Annual English 1995

Course Title: *M.Sc./Diploma in Applied and Agricultural Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

TOPICS studied include: Atmospheric Physics, Atmospheric Chemistry, Weather Systems, Measurement and Instrumentation, Global Ecology, Introductory Computing, Agricultural Meteorology, Climate Change, Hydrometeorology, Micrometeorology, Remote Sensing, Statistical Climatology, Tropical Weather Systems.

Course work, examinations and dissertation contribute to the final mark.

The course aims to provide the scientific background needed for work in all branches of applied meteorology, including agrometeorology. The interaction between the atmosphere and ecosphere is emphasised. The course comprises two 10-week terms of taught modules followed by a four-month period preparing a dissertation. Practical work and computing are included in several component modules. A preliminary (ad hoc) period of up to one year is available for candidates whose qualifications fall below the entrance requirements. Course fees (1995/96): £2,430 (students from European Economic Area) £7,840 (students from elsewhere); plus evidence of about £6,000 for living expenses.

Entry: Honours degree in mathematics, physics or related subject.

GBR-2-7 Key-words: MET Scientific Cl. 1c UnivS-DynaM 3 years Annual English 1995

Course Title: *Ph.D., M.Phil. in Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

SYNOPSIS: During the first year, lecture courses selected from the M.Sc. programme are taken. The choice of courses is related to the research topic. Thereafter a programme of research under the supervision of a member of the academic staff is undertaken. By the end of the second year the student is recommended for either Ph.D. or M.Phil. registration for the final year. A dissertation is submitted and an oral examination of the candidate forms the basis of the assessment.

Course fees (1995/96): £2,430 (students from European Economic Area); £7,800 (students from elsewhere); plus written evidence of about £6,200 per year for living expenses.

Entry: 1st or upper 2nd class honours degree in mathematics or physical science, OR M.Sc. in mathematics, physical or atmospheric science.

GBR-3	University of Birmingham	TEL: (44-121) 414-6935
Contact	University of Birmingham	FAX: (44-121) 414-5528
Address:	Senior Assistant Registrar, Faculty of Science, or Dr G.R. McGregor, School of Geography Edgbaston, BIRMINGHAM B15 2TT, UK	E-M/tlx. G.R.McGregor@bham.ac.uk

GBR-3-1 Key-words: MET Clhymet Cl. 1-4 UnivS-Clima 1 year Annual English 1995

Course Title: *M.Sc. in Applied Meteorology and Climatology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

COMPULSORY COURSES: Theoretical Meteorology; Weather Forecasting; Statistics and Computing; Maths; Physics; Dissertation. OPTIONS: Two from Biometeorology; Synoptic Climatology in Environmental Analysis; Air Pollution Meteorology; Marketing Meteorological Services; Atmospheric Management. Note that Optional courses offered may vary from year to year.

The aim of the course is to provide a thorough training in the areas of applied meteorology and climatology through both taught courses and research. This aim is achieved by: (i) providing students with an understanding of the processes operating in the atmosphere including their spatial and temporal variability and how these processes and their variability create opportunities or pose problems for the successful operation of natural and human systems; (ii) developing through taught courses a deeper understanding of the theoretical concepts and methods of meteorology and climatology; (iii) providing appropriate training that will allow students to search for and process meteorological and climatological information efficiently and apply theoretical concepts and analytical techniques to the resolution of environmental and socio-economic problems that have an atmospheric origin; and (iv) developing students' ability to communicate their ideas and research effectively in different written formats, visually or orally. Course runs annually from late September. Annual tuition fees in 1995/96: Home/EEC students, pounds sterling 2430; Overseas students: pounds 7960.

Entry: First degree in relevant subject at second class honours or equivalent.

GBR-4	University of Dundee	TEL: (44-1382) 344 557
Contact	University of Dundee	FAX: (44-1382) 202 830
Address:	Department of Applied Physics and Electronic & Manufacturing Engineering DUNDEE DD1 4HN, United Kingdom	E-M/tlx: t.a.vaughan@dundee.ac.uk

GBR-4-1 Key-words: ENV Scientific Cl. 1c UnivS-Advan 1 year Annual English 1995

Course Title: *M.Sc. in Remote Sensing, Image processing and applications*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

LECTURE courses include: Physical principles of remote sensing. Platforms, systems and sensors. Air photo interpretation, data acquisition, transmission, reception and archiving. Atmospheric corrections. Applications in the visible, infrared and thermal wavebands. Active and passive microwave systems. Computing. Digital and optical image processing. Image data and colour interpretation. Applications in geography, geology, hydrology, meteorology, oceanography, etc. Geographical information systems. PROJECT: six months' individual project work.

This 12-month taught M.Sc. course is coordinated by the Department A.P.E.M.E. in the University of Dundee but draws on contributions from 25 collaborating departments in 19 academic and research institutions in eight EU Countries. The course starts in October. The first six months are devoted to formal teaching, with lectures, practical exercises using remote sensing data and materials, and practice in computing, image processing and pattern analysis techniques. The second six months are devoted to project work either in Dundee or in one of the collaborating institutions. The course aims to provide a broad background to the different aspects of remote sensing whilst enabling students to specialize within their chosen field in their project work.

Entry: HONS Degree.

GBR--5	University of London	TEL: (44-171) 975-5400
Contact	University of London	FAX: (44-171) 975-5500
Address:	Department of Geography Queen Mary and Westfield College, Mile End Road LONDON E1 4NS, United Kingdom	E-Mail: J.J.Page@qmw.ac.uk

GBR--5--1	Key-words: MET Scientific	Cl. 1a	UnivE-Bases	22 weeks	Annual	English	1995
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Course Title: *Dynamical Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

TOPICS covered are: heat and water balances of the atmosphere; the general circulation and the basic transfer mechanisms; the origin and structure of the mid-latitude westerlies and meso-scale circulations.

The course forms part of the B.Sc. programme in Queen Mary and Westfield College and is taken by undergraduate students in geography, environmental science, physics, engineering and mathematics. The aim is to give an introduction to the dynamic state of the atmosphere on scales ranging from global to local. The course is intended for those with a limited knowledge of atmospheric behaviour and inexperience in the application of physical principles to a component of the environment. The course is run wholly in the Department and is assessed by one three-hour examination. Further information on all courses offered in the Department of Geography may be obtained from: Carole Duncan-Jones, Department of Geography, Queen Mary and Westfield College, University of London, Mile End Road, London, E1 4NS. Email: C.Duncan-Jones@qmw.ac.uk. Tel: 0171 975 5418.

Entry: Three A levels or equivalent in physical or environmental sciences.

GBR--5--2	Key-words: MET Scientific	Cl. 1a	UnivE-Bases	22 weeks	Annual	English	1995
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Course Title: *Meso-scale Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

The course concentrates upon the nature and origins of meso-scale atmospheric circulations. The circulations are grouped into two categories - those involving the planetary boundary layer and those in the free-atmosphere. Within each category two further groupings are used - circulations that are thermally forced and those that are mechanically forced. The observational theoretical and modelling aspects of each circulation are covered. The course is based upon the book MESO-SCALE ATMOSPHERIC CIRCULATIONS (Academic Press, 1981) by B.W. Atkinson.

The course forms part of the B.Sc. programme in Queen Mary and Westfield College and is taken by undergraduate students in geography, environmental science, biology and engineering. The course runs wholly in the Department of Geography and is assessed by one three-hour examination. For details see further information under GBR--5--1.

Entry: Three A levels or equivalent in physical or environmental sciences.

GBR--5--3	Key-words: HYD Scientific	Cl. 1a	UnivE-Bases	22 weeks	Annual	English	1995
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Course Title: *Applied Hydrology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

SYNOPSIS. This course teaches advanced analytical techniques and theory used by hydrologists, as managers of the water environment, and introduces students to current research in hydrology. Topics covered in lectures, seminars and practicals include: lowflow analysis; flood estimation and prediction; climate change and flow regimes; and hydrograph analysis. A short field course covers land use change and reservoir schemes.

The course forms part of the B.Sc. programme in Queen Mary and Westfield College and is taken by undergraduate students in geography, environmental science, physics, engineering and mathematics. The course is run wholly in the Department and is assessed partly by examination (50%) and course work (50%). For details see further information under GBR--5--1.

Entry: Three A levels or equivalent in physical or environmental sciences.

GBR--5--4	Key-words: HYD Scientific	Cl. 1a	UnivE-Water	22 weeks	Annual	English	1995
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Course Title: *Environmental Hydrology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PART 1: Processes in the hydrological cycle.

PART 2: Water quality problems and assessment.

PART 3: UK water industry; supply, demand and regulation.

The course forms part of the B.Sc. programme in Queen Mary and Westfield College and is taken by undergraduate students in geography, environmental science, physics, engineering and mathematics. The course aims to provide an understanding of hydrological principles with respect to human influences on water resources. The course runs wholly in the Department of Geography and is assessed by a mixture of practicals and written examination. For details see further information under GBR-5-1.

Entry: Three A levels or equivalent in physical or environmental sciences.

GBR-6	University of Bradford	TEL: (44-1274) 384 232
Contact	University of Bradford	FAX: (44-1274) 384 231
Address:	Department of Environmental Science BRADFORD BD7 1DP Yorkshire, United Kingdom	E-Mail: J.E.Bailey@Bradford.ac.uk

GBR-6-1 Key-words: ENV Clhymet Cl. 1a UnivE-Envir 3 months Annual English 1995

Course Title: *Earth science (Atmospheric processes)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

CORE SUBJECTS include: Atmospheric structure, composition and water of component cycling. General radiation laws and radiation balance/energy exchanges. Evaporation, condensation processes, types of precipitation and cloud, conditions of stability/instability. Atmospheric pressure and wind systems, airflow, mixing. Microclimates-topoclimates produced by local environmental variation. Global climates and introduction to climatic change.

The course provides a foundation for later studies in hydrology, and air pollution specializations.

Entry: Wide range e.g. 'A' level in sciences; BTEC; o.u. Science Foundation Pass, etc.

GBR-7	University of Edinburgh	TEL: (44-131) 650-5101
Contact	University of Edinburgh	FAX: (44-131) 662-4269
Address:	Department of Meteorology JCMB, Kings Buildings EDINBURGH EH9 3JZ, United Kingdom	E-Mail: K.Weston@ed.ac.uk

GBR-7-1 Key-words: MET Scientific Cl. 1 UnivE-PhysM 4 years Annual English 1995

Course Title: *B.Sc. with Honours in physics with meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

YEAR I : Physics 1A; Maths 1A or C; another course.

YEAR II: Physics 2; Maths 2A, 2X or 2D; Meteorology 1.

YEAR III: Physics 3.

YEAR IV: Physics with Meteorology 4.

METEOROLOGY CONTENT : "Meteorology 1" - basic understanding of meteorology, including weather systems, physical and dynamical meteorology. "Physics with Meteorology 4" - students attend six lecture course units, chosen from those offered in Physics 4, but must include Atmospheric Dynamics, Atmospheric Modelling and Atmospheric Physics. "Project Work" will be carried out and must include at least one on a meteorological topic. Each student will submit a written report on a seminar topic.

Entry: As for honours degree in physics.

GBR-7-2 Key-words: MET Operational Cl. 4 UnivE-Atmos 1 year Annual English 1995

Course Title: *Meteorology 1*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

PHYSICAL METEOROLOGY: Composition and structure; basic physical equations; water in the atmosphere; condensation and cloud formation; radiation - solar and terrestrial, radiation balance, global balance; greenhouse effect; ozone and the ozone hole. Optics. WEATHER SYSTEMS: Survey of motions. Introduction to the weather map and satellite images. The tephigram. Cumulus and cumulonimbus convection. Hurricanes, midlatitude systems: fronts, airmasses, depressions, anticyclones. Pollution and acid rain. DYNAMICAL METEOROLOGY: Forces. Geostrophic flow. The thermal wind. The dynamics of various motion systems. Forecasting. Oceanography.

This full first-level course (66 lectures) aims to give an introduction to meteorology. It covers weather observations, the three-dimensional structure weather systems, radiation in the atmosphere, basic

dynamics and atmospheric issues such as the ozone hole, air pollution and global warming.

Entry: As for entry to University degree.

GBR-7-3 Key-words MET Scientific Cl.1c UnivE-Atmos 1 year Annual English 1995

Course Title: *M.Sc. in Atmospheric Science*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

SYNOPSIS: A one-year course suitable for students with a background in Maths or Physics. Workshops, work assignments and reading modules: Basic Meteorology. Small-scale atmospheric motions. Large-scale atmospheric motions. Atmospheric dynamics. Environmental issues.

The above is followed by a project and the writing of a dissertation.

Entry: Honours degree in physical science.

GBR-8 University of Southampton

TEL: (44-1703) 593 728

Contact University of Southampton

FAX: (44-1703) 677 519

Address: Institute of Irrigation Studies
SOUTHAMPTON, SO14 1BJ
United Kingdom

E-M/tlx: dso@soton.ac.uk

GBR-8-1 Key-words: ENV Clhymet Cl.1c UnivS-Agric 12 months Annual English 1995

Course Title: *M.Sc. Course in Irrigation Engineering*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

TOPICS studied include: Irrigation; irrigation systems, irrigation design; management, operation and maintenance; drainage; soils, hydrology and water resource development; hydrogeology; groundwater engineering; river and canal hydraulics; project planning and implementation; management economics; dams; pumps; statistics; computation; communication; design analysis module; management development module.

The course aims to give an up-to-date understanding of irrigation methods and environments and so provide a sound basis for professional practice in the design and operation of systems of irrigated agriculture. It recognizes that in future an increasing number of Irrigation Engineers will become involved in the management, operation and rehabilitation of irrigation projects in order to raise their productivity. The course provides lectures on the topics listed above. In addition, each student will carry out course work, including practical laboratory classes, and research work as directed. Fees £10,910 for overseas students in 1995/96.

Entry: B.Sc. Civil Engineering or equivalent.

GBR-8-2 Key-words: ENV Clhymet Cl.1c UnivS-Agric 12 months Annual English 1995

Course Title: *M.Sc. Course in Soil Conservation and Land Reclamation Engineering*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

TOPICS studied include: Erosion-water; erosion-wind; hydrology; soils; agriculture; survey and classification; river and canal hydraulics; rural development; forest and pasture management; catchment management and land use planning; field engineering; slope engineering; river engineering implications, project planning and appraisal; surveying; computation; statistics and experimentation; communication.

The course aims to give an up-to-date understanding of irrigation methods and environments and so provide a sound basis for professional practice in the design and operation of systems of irrigated agriculture. It recognizes that in future an increasing number of Irrigation Engineers will become involved in the management, operation and rehabilitation of irrigation projects in order to raise their productivity. The course provides lectures on the topics listed above. In addition, each student will carry out course work, including practical laboratory classes, and research work as directed. Fees £10,910 for overseas students in 1995/96.

Entry: B.Sc. Civil Engineering, Agriculture or equivalent.

GBR-9 University of Manchester

TEL: (44-161) 200-4047

Contact University of Manchester, Physics Department

FAX: (44-161) 200-4019

Address: Graduate School UMIST
P.O. Box 88
MANCHESTER M60 1QD, United Kingdom

E-M/tlx: m.shingler@umist.ac.uk

GBR-9-1 Key-words: MET Scientific Cl.1 UnivE-PhysM 1 year Annual English 1995

Course Title: *M.Sc. in Atmospheric Physics*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

SYNOPSIS: Basic meteorology. Cloud and aerosol physics. Chemical transformations in the atmosphere. Boundary layer physics and dynamics. Transport and deposition processes. Radiative transfer in the atmosphere. Data analysis techniques. Project (field, laboratory or modelling).

Course details subject to alteration; planned commencement September 1997.

Entry: 1st degree in physics or mathematics or relevant scientific subject.

GBR-10	University of Stirling	TEL: (4401786) 467 847
Contact	University of Stirling	FAX: (44-1786) 467 843
Address:	Department Environmental Science	E-M/tlx: sjh@stir.ac.uk
	STIRLING FK9 4LA, United Kingdom	

GBR-10-1 Key-words: ENV Scientific Cl.1a UnivE-Envir 4 years Annual English 1995

Course Title: *Environmental Science*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

YEARS 1 and 2 - atmosphere and hydrosphere (basic meteorology and hydrology) three compulsory courses: Earth science and materials. Biosphere. Sustainable use of environmental systems.

YEAR 3 - five options from: Environmental management and planning. Environmental geomorphology. Climate and pollution (boundary layer climatology). Soil science. Drainage basins (catchment hydrology). Environmental change. Remote sensing and GIS.

YEAR 4 - Compulsory honours research project, plus honours review essay, plus four electives from list of those available (usually 15) including: Microclimatology (field monitoring and modelling of fluxes). Environmental Hazards (weather impacts). Rivers. Environmental pollution.

Instructors in meteorology are both FRMetS and members of the Association of British Climatologists. Training courses in road surface microclimatology and weather radar are offered on a consultancy basis to local roads departments. In-service training courses for teachers offered on basic meteorology.

Entry: Maths + English standard/GCSE. At least one science higher or 'A' level. Higher BBBC A level CCC.

GBR-11	University of Nottingham	TEL: (44-115) 951-6260
Contact	University of Nottingham	FAX: (44-115) 951-6261
Address:	Department of Physiology and Environmental Science	E-M/tlx: Nottingham@ac.uk
	Sutton Bonington	
	LOUGHBOROUGH, Leics, LE12 5RD, UK	

GBR-11-1 Key-words: ENV Clhymet Cl.1c UnivS-Envir 1-2 years Annual English 1995

Course Title: *Environmental Science - Measurement, modelling and analysis*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

SOIL AND WATER SCIENCE: Absorption process; ion transportation; pH and redox control; the hydrological cycle; salinity control. ENVIRONMENTAL MEASUREMENT: Measurement principles; errors; atmospheric, soil and water variables, data acquisition, logging and handling. ATMOSPHERE-BIOSPHERE INTERACTIONS: Heat and mass balances; radiative transfer; turbulent transfer, fluxes. VEGETATION-ENVIRONMENT INTERACTIONS: Growth and development related to light, water, nutrients and temperature; growth analysis; energy and water-use efficiencies. COMPUTING TECHNIQUES: Computing tools; microcomputer interfaces and data capture; UNIMAP, UNIGRAPH, expert systems, GIS and data bases, structured programming. AIR POLLUTION: Production and transport; deposition; ecosystem effects; air-soil-water relationships; regulation and control. SOIL AND WATER POLLUTION AND RECLAMATION: Pollution pathways; heavy metals, nitrate, pesticides and radionuclides; acidification; control and reclamation measures. REMOTE SENSING: Radiation interactions; platforms and sensors; images and data processing; ground truth; case studies. MANAGEMENT OF ENERGY RESOURCES: Fossil, nuclear and renewable fuels; environmental impacts; fundamentals of energy conversion; conservation. ECOLOGY, CONSERVATION AND MANAGEMENT: Habitat survival and preservation; ecology and management of semi-natural habitats. RIVER CHANNEL PROCESSES AND MANAGEMENT: Shows how the principles and models developed in physical geography may be applied when undertaking engineering-geomorphic analyses of the fluvial processes and fluvial landforms and their impact on the landscape features of river basins. Provides a basis for

environmentally-sound resource and hazard management.

The M.Sc. in Environmental Science has been designed to satisfy the growing demand for Science graduates capable of applying quantitative methods to environmental problems. The M.Sc. is usually taken over one year, beginning in October. An M.Phil. may be available. The Faculty is a UK leader in research and teaching of Environmental and Agricultural Sciences. The Unit has excellent field facilities for microclimatology and for studies of crops and animal microclimate. There are also good facilities for aspects of tropical crop microclimatology and for computing. The section is situated in a pleasant rural setting, with easy access to nearby towns and cities. The University fees for the M.Sc. for 1995/96 are £2,430 for UK and EC students and £8,118 for overseas students. Contact is maintained with past students and employment records show that a high proportion enter relevant fields after graduation. Further details are available from Dr Keith Gregson.

Entry: B.Sc. in a physical, environmental or biological science, or in physical geography.

UNITED STATES OF AMERICA, The

USA--1	Colorado State University	TEL: (970) 491-8360
Contact	Colorado State University	FAX: (970) 491-8449
Address:	Department of Atmospheric Science Atmospheric Science Building FORT COLLINS, Colorado 80523, USA	E-M/tx: scox@vines.colostate.edu

USA--1--1 Key-words: GEO Scientific Cl.1c UnivS-ET&R 2-3 years Annual English 1995

Course Title: *Atmospheric Science Programme: Master of Science (M.Sc.), Doctor of Philosophy (Ph.D.)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES : Introduction to Weather and Climate; Introduction to Weather and Climate Laboratory; Meteorology Seminar; Independent Study; Group Study; Daily Weather Laboratory; Daily Laboratory II; Air Pollution; Air Pollution Measurements.

GRADUATE COURSES: Atmospheric Dynamics I; Atmospheric Dynamics II; Atmospheric Circulation; Climatology; Thermodynamics and Chemistry of the Atmosphere; Cloud Physics; Atmospheric Radiation; Convection and Planetary Boundary Layer; Measurement Systems and Theory; Meteorological Analysis and Forecasting; Experimental Graduate Courses; Atmospheric Science; Independent Study; Thesis; Numerical Weather Prediction; Planetary Circulation; Atmospheric Waves; Geophysical Vortices; Micrometeorology; Dynamics of Clouds; Theoretical Topics in Radiative Transfer; Atmospheric Radiation and Energetics; Cloud Microphysics; Mesoscale Modeling; Mesoscale Dynamics; Satellite Observation of Atmosphere and Earth; Tropical Atmosphere; Advanced General Circulation; Weather Modification; Atmospheric Water Resources; Theoretical and Applied Climatology; Physical Oceanography; Aerosol Chemistry; Topics in Air Pollution; Atmospheric Photochemistry and Kinetics; Supervised College Teaching; Practicum; Independent Study; Group Study; Dissertation.

The Department of Atmospheric Science is located on the CSU Foothills campus. The four-story Atmospheric Science Building and several smaller buildings provide over 37,000 square feet of office and research space. Academic and research facilities include a geosynchronous satellite receiving station; extensive hardware and software systems for the display and analysis of satellite and radar data; a digital weather laboratory; a cloud simulation laboratory; an extensive field observation system including a 10 cm Doppler dual polarization radar; a UHF Doppler wind profiler with a Radio Acoustic Sounding System; rawinsonde and tethered balloon systems; infrared and visible wavelength interferometers and spectral radiometers; multiple surface energy budget stations; and electronics and machine shops. Extensive computer resources are available ranging from PCs to super workstations capable of running complex atmospheric models. Convenient access to the Internet through CSU's fibre optic campus backbone and to other supercomputers throughout the United States through WestNET and NSFNET is provided. The Cooperative Institute for Research in the Atmosphere (CIRA) has been formed between CSU and NOAA. Research programmes in CIRA include several faculty and students in the Department and are often of an interdisciplinary nature.

Entry: Applicants must have a B.Sc. degree with a strong background in physics and mathematics. A background in atmospheric science is an asset.

USA--2	University of Miami	TEL: (305) 361-4057
Contact	University of Miami	FAX: (305) 361-4696
Address:	Division of Meteorology and Physical Oceanography MIAMI, Florida 33149-1098, USA	E-M/tx: jovert@rsmas.miami.edu

USA--2--1 Key-words: GEO Scientific Cl.1b-1c UnivS-ET&R 3-4 years Annual English 1995

Course Title: *Postgraduate Programme in Meteorology and Physical Oceanography*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES (Administered by the Undergraduate Marine and Atmospheric Science Department): Introduction to Atmospheric Science; Descriptive Physical Oceanography; Current Weather Topics; Introduction to Meteorology; Weather Forecasting; Introduction to Physical Oceanography; Meteorological Instrumentation; Atmospheric Thermodynamics; Atmospheric Dynamics I; Atmospheric Dynamics II; Weather Analysis; Tropical Meteorology; Physical Meteorology; Projects in Marine Science.

GRADUATE COURSES: Oceanography I; Physical Oceanography; Geophysical Fluid Dynamics I; Remote Sensing of the Atmosphere; Estuarine and Coastal Processes; Physical Meteorology; Satellite Oceanography; Introduction to Atmospheric Sciences; Synoptic Meteorology Laboratory; Supervised

Projects; Seminars in Meteorology and Physical Oceanography; Geophysical Fluid Dynamics II; Large-scale Ocean Circulation - Models and Observations; Numerical Weather Prediction; Waves and Tides I; Statistical Analysis of Geophysical Data; Statistical Modelling of Geophysical Data; Air-Sea Interaction; Planetary Fluid Dynamics; Tropical Meteorology; Synoptic Scale Meteorology; Computer Models in Fluid Dynamics; Convective and Mesoscale Meteorology; Atmospheric and Oceanic Turbulence; General Circulation of the Atmosphere; Advanced Studies in Meteorology and Physical Oceanography; Research in residence; Doctoral dissertation.

The Rosenstiel School of Marine and Atmospheric Science is one of the few institutions in the nation with a strong graduate research focus in both Meteorology and Oceanography. This gives students the opportunity not only to obtain a good education in either field, but also to study subject areas where the fields overlap, such as air-sea interaction or climate dynamics. The curriculum within the Division of Meteorology and Physical Oceanography stresses the physical processes governing the motion and composition of the ocean and atmosphere, and emphasizes the interactive nature of the earth-atmosphere system. Research activities in the Division range from direct observation to theoretical modelling of either fluid. University resources include a modern fleet of research vessels and excellent computer facilities, both in-house and with high speed network access to the National Center for Atmospheric Research in Boulder, Colorado. The wide range of meteorological and oceanographic investigations carried out by scientists of the Division gives students a choice of research projects dealing with phenomena in many parts of the world.

Entry: Applicants must have a B.Sc. degree with a strong background in physics and mathematics. A background in meteorology or in physical oceanography is not necessary but is an asset.

USA-3	University of Kansas	TEL:	(913) 864-4626
Contact	University of Kansas	FAX:	(913) 864-5262
Address:	Department of Physics and Astronomy	E-Mail:	
	1082 Malott Hall		
	LAWRENCE, KANSAS 66045, USA		

USA-3-1 Key-words: GEO Operational Cl 1a-1c UnivF-Bases 4 years Annual English 1995

Course Title: *Atmospheric Science Programme: B.Sc.; M.Sc. in Physics - Emphasis in Geophysics*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Introduction to Meteorology; Unusual Weather; Weather Forecasting; Microclimatology; Synoptic Meteorology; Dynamic Meteorology; Seminar for Seniors; Air Pollution Meteorology; Forecasting Practicum.

GRADUATE COURSES: Advanced Synoptic Meteorology; Advanced Dynamic Meteorology; Remote Sensing of the Atmosphere; Physical Meteorology; Special Problems; Atmospheric Modelling: Numerical Weather Prediction; Atmospheric Storms; Computational Physics and Astronomy; Geophysics; Fluid Dynamics; Master's Thesis; Geophysical Data Analysis; Advanced Geophysics.

UNIX workstations collecting worldwide weather data and output of numerical models are available for conducting research, teaching and making weather forecasts. Facilities include a wind tunnel and vortex generation laboratory, and the programme maintains an official weather station on campus. Both excellent library resources and archived data sets are available. The Department also has substantial networked computing facilities with full-time systems manager.

Entry: University admission.

USA-4	Millersville University of Pennsylvania	TEL:	(717) 872-3289
Contact	Millersville University of Pennsylvania	FAX:	(717) 872-3985
Address:	Department of Earth Sciences	E-Mail:	cscharnb@marauder.millersv.edu
	Rody Science Center		
	MILLERSVILLE, PENNSYLVANIA 17551, USA		

USA-4-1 Key-words: GEO Operational Cl. 1a UnivE-Intl 4 years Annual English 1995

Course Title: *Meteorology Programme: B.Sc.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

METEOROLOGY and OCEANOGRAPHY, Undergraduate Courses: The World Ocean; The Atmosphere; Introduction to Earth Sciences Programs; Remote Sensing and Image Interpretation; Applications of Computers in the Earth Sciences; Topics in Earth Sciences; Air-Sea Interaction; Seminar in the Earth Sciences.

METEOROLOGY, Undergraduate Courses: General Meteorology; Environmental Meteorology; Physical

Meteorology; Atmospheric Thermodynamics; Atmospheric Dynamics I; Atmospheric Dynamics II; Tropical Meteorology; Storm and Cloud Dynamics; Satellite Meteorology; Broadcast Meteorology; Hydrology; Synoptic Meteorology Lecture-Laboratory-I; Synoptic Meteorology Lecture-Laboratory II; Mesoscale Meteorology; Statistical Meteorology; Boundary Layer Meteorology. OCEANOGRAPHY, Undergraduate Courses: Introduction to Oceanography; Marine Geology; Chemical Oceanography; Descriptive Physical Oceanography; Dynamical Physical Oceanography; Ocean Resources; Biological Oceanography; Coastal and Estuarine Oceanography.

Weather station plus a ground-mounted tower equipped with high-frequency, computer accessed instrumentation at multiple levels. Tethered balloon capable of monitoring atmospheric variables at multiple levels up to three kilometers. Two satellite receiving systems that acquire data and satellite imagery for processing by software from WSI, Inc. This software display package is the same used by many TV weather stations. A weather laboratory/classroom equipped with seven SUN UNIX workstations and three IBM OS/2 microcomputers: The UNIX work-stations use UNIDATA's distributed software (McIDAS, GEMPAK and WXP) for analysis of meteorological data. In addition, one system contains the latest mesoscale model from NCAR. A newly-installed weather observatory is now on the top floor of the Roddy Science Center and contains UNIX workstations and direct read-out computer display of the ground mounted tower.

Entry: University admission.

USA-5	University of Arizona	TEL: (602) 621-6831
Contact	The University of Arizona	FAX: (602) 621-6833
Address:	Department of Atmospheric Sciences and Institute of Atmospheric Physics TUCSON, Arizona 85721, USA	E-M/lix: asdept@atmo1.atmo.arizona.edu

USA-5-1 Key-words: MET Scientific Cl. 1a-1c UnivE-ET&R 1-4 years Annual English 1995

Course Title: *Atmospheric Sciences Programme: B.Sc., M.Sc., Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Introduction to Meteorology and Climatology; Intro to Meteorology and Climatology Lab; Colloquium: The Atmosphere, Univ of Arizona and You; General Meteorology a & b; Weather, Climate and Society; Atmospheric Measurements; Physical Climatology; Air Pollution Meteorology; Dynamic Meteorology a & b; Introduction to Physical Meteorology a & b; Aerosol Science and Engineering; Computer Methods in the Atmospheric Sciences; Advanced Statistical Methods in the Atmospheric Sciences; Mesoscale Analysis; Synoptic Meteorology; Weather Analysis and Forecasting; Remote Sensing for the Study of Planet Earth.

GRADUATE COURSES: Physical Climatology; Micrometeorology; Air/Sea Interactions; Air Pollution Meteorology; Dynamic Meteorology a & b; Physics of the High Atmosphere; Remote Sensing of the Atmosphere by Active Techniques; Introduction to Physical Meteorology a & b; Aerosol Science and Engineering; Computer Models in the Atmospheric Sciences; Advanced Statistical Methods in the Atmospheric Sciences; Mesoscale Analysis; Inverse Problems in Geophysics; Synoptic Meteorology; Weather Analysis and Forecasting; Remote Sensing Instrumentation and Techniques; Tropospheric Chemistry; Atmospheric Electricity; Remote Sensing for the Study of Planet Earth; Theoretical Meteorology; Cloud and Precipitation Physics; Atmospheric Radiation and Remote Sensing a & b. CORRESPONDENCE COURSE: Introduction to Meteorology and Climatology.

Research activities of the Department of Atmospheric Sciences are conducted in the Institute of Atmospheric Physics. Among the special facilities of the Institute are a network of 2D and 3D UNIX graphic workstations, equipment for active and passive remote sensing, a mountain altitude laboratory, chemical laboratories and shops. Currently, there is special interest in research questions on global change, climate modelling, atmospheric dynamics, atmospheric radiation, remote sensing, atmospheric chemistry, cloud and precipitation physics, lightning and atmospheric electricity. The University of Arizona has recently created an Institute for the Study of Planet Earth (ISPE) for promoting research and teaching on global change and related topics. The impetus for ISPE derives directly from the increasing national and international concern for global environmental issues. ISPE will draw on the strengths of many programmes at The University of Arizona. The Institute of Atmospheric Physics will play an important role in the global change research within ISPE that focuses on the atmosphere.

Entry: University admission.

USA-6	The University of Hawaii, Department of Meteorology	TEL: (808) 956-8775
Contact	The University of Hawaii	FAX: (808) 956-2877
Address:	School of Ocean and Earth Science & Technology 2525 Correa Road, HIG 331 HONOLULU, HI 96822, Hawaii	E-M/tlx: tas@soest.hawaii.edu

USA-6-1 Key-words: MET Scientific Cl.1a-1c UnivE-ET&R 1-4 years Annual English 1995

Course Title: *Meteorology Programme: M.Sc., Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Introduction to Meteorology; Introduction to Meteorology Laboratory; Descriptive Meteorology; Atmospheric Physics; Introduction to Atmospheric Dynamics; Meteorological Instruments & Observations; Applied Atmospheric Dynamics; Satellite Meteorology; Tropical Meteorology; Meteorological Analysis Laboratory; Tropical Analysis Laboratory.

GRADUATE COURSES: Atmospheric Dynamics I; Atmospheric Dynamics II; Cumulus Dynamics; Mesoscale Meteorology; Tropical Climate and Weather; Advanced Tropical Meteorology Laboratory; Monsoon Meteorology; Physical Meteorology; Cloud Physics; Statistical Meteorology; Air Pollution Meteorology; Directed Research; Thesis Research; Midlatitude Dynamic Meteorology; Tropical Dynamic Meteorology; Special Topics in Meteorology; Seminar in Meteorology; Dissertation Research.

The Department of Meteorology, which has nine regular faculty members, is located at the Manoa (Honolulu) Campus on the Island of Oahu. Through courses in theoretical, statistical and physical meteorology and in analysis and forecasting, students develop a strong foundation for study and research in the Department's special field - tropical meteorology. In particular, cloud physics, synoptic and numerical modelling, satellite meteorology, monsoon meteorology, ocean-atmosphere interaction, interaction of tropics with midlatitudes, mesoscale meteorology, and environmental studies are emphasized. On the Manoa Campus research capabilities include ready access to Alliant FX-8, IBM 3081, and CRAY X MP48 (San Diego Supercomputing Center) computing systems; excellent library holdings; an unequalled and up-to-date tropical data file; and a comprehensive satellite data archive. (We are the archive site for the Satellite Field Services Station at Honolulu International Airport). Other facilities include an extensive mesoscale instrument array on Maui, wind tunnel, instruments laboratory and weather radar. The Department participates in the NOAA-University of Hawaii Joint Institute for Marine and Atmospheric Research (JIMAR).

Entry: University admission.

USA-7	Oregon State University - College of Oceanic and Atmospheric Sciences	TEL: (503) 737-5189
Contact	Oregon State University	FAX: (503) 737-2064
Address:	College of Oceanic and Atmospheric Sciences Oceanography Administrative Bldg. 104 Corvallis, OREGON 97331-5503, USA	E-M/tlx: delsoni@ccmail.orst.edu

USA-7-1 Key-words: MET Scientific Cl.1c UnivS-Rsrch 1-3 years Annual English 1995

Course Title: *Atmospheric Sciences Programme: M.A., M.Sc., Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSE: Introduction to the Atmospheric Sciences.

GRADUATE COURSES: Research in Atmospheric Sciences; Thesis; Reading & Conference; Projects; Atmospheric Physics; Atmospheric Radiation; Atmospheric Chemistry; Atmospheric Dynamics I; Atmospheric Dynamics II; Geophysical Boundary Layers; Planetary Atmospheres; Seminar; Interactions of Vegetation & Atmosphere; Selected Topics; Physics of Climate; Atmospheric Radiation and Remote Sensing; Coupled Ocean-Atmosphere Dynamics; Aerosol and Cloud Physics; General Circulation Dynamics; Climate Dynamics.

Some courses are given jointly with the Physical Oceanography group. The course AS 210 Introduction to the Atmospheric Sciences, is the only undergraduate course offered by Atmospheric Sciences at Oregon State University and is offered as a courtesy to other departments having undergraduate students for whom this is a degree requirement (e.g. Natural Resource Management; Environmental Sciences; etc). Most students are admitted with funding from research grants of their faculty advisors. These are called Research Assistantships and the stipend for the academic year is \$ 15,450 plus a tuition waiver. There are occasional Teaching Assistantships (for the undergraduate course, for example); the stipend is the same amount.

Entry: University admission.

USA-8 **Iowa State University; Atmospheric Sciences Division** TEL: (515) 294-4758
 Contact Iowa State University FAX: (515) 294-3163
 Address: Department of Geological and Atmospheric Sciences E-Mail: DOUG@IASTATE.EDU
 3010 Agronomy Hall
 AMES, IOWA 50011, USA

USA-8-1 Key-words: MET Operational Cl. 1a-1c UnivE-ET&R 4-6 years Annual English 1995

Course Title: *Meteorology Programme: B.Sc., M.Sc., Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Technical Lectures; Introduction to Meteorology; General Meteorology I; Weather Observations Lab; General Meteorology II; Synoptic Laboratory I; Use of Weather Data in Agriculture; Coop. Education in Meteorology; Atmospheric Physics I; Atmospheric Physics II; Global Climate Change; Climates of Continents; Dynamic Meteorology I; Dynamic Meteorology II; Synoptic Laboratory II; Dynamic Meteorology III; Synoptic Laboratory III; Independent Study; Seminar.

GRADUATE COURSES: Global Climate Change; Microclimatology; Atmospheric Physics; Dynamical Meteorology I; Dynamical Meteorology II; Tropical Meteorology; Geophysical Fluid Dynamics; Cloud Physics; Special Topics; Micrometeorology; Research.

Types of financial support available: Fellowships, Teaching Assistantship; Research Assistantship. Graduate Stipends: half-time - two semesters; Teaching or Research Assistantship \$ 1,000. per month (subject to increase) for M.Sc. Student, Ph.D. Student, or Ph.D. Candidate. Total dollar amount toward academic year tuition, fees, etc. paid out-of-pocket by all graduate students with above appointments \$ 1,600.

Entry: University admission.

USA-9 **Plymouth State College** TEL: (603) 535-2325
 Contact Plymouth State College FAX: (603) 535-2723
 Address: Natural Science Department; Boyd Hall E-Mail: JOEZ@PLYMOUTH.PSC.EDU
 PLYMOUTH, NEW HAMPSHIRE, 03264-1600
 USA

USA-9-1 Key-words: MET Operational Cl. 1a ProfE-Synop 4 years Annual English 1995

Course Title: *Meteorology Programme: B.Sc.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Introduction to Meteorology; Introduction to Meteorological Analysis; Meteorological Instruments and Observations; Climatology; Atmospheric Thermodynamics; Synoptic Meteorology I; Air Pollution; Forecast/Broadcast Practicum; Synoptic Meteorology II; Dynamic Meteorology I; Dynamic Meteorology II; Current Weather Seminar; Atmospheric Physics; Advanced Synoptic Meteorology; Senior Research; Topics: Climate Change, Mesometeorology, Micrometeorology, Tropical Meteorology, Numerical Weather Prediction; Internship; Independent Study; Introduction to Oceanography.

Plymouth State College offers scholarships to qualified entering and continuing students in the amount of \$ 1,000 per year. The Meteorology Program at Plymouth State College is supported by a variety of equipment and facilities: weather data are received via Zephyr satellite service - included currently are DIFAX (Digital map service), the Domestic Data Service, and the UNIDATA/PC-McIDAS system; an IBM RISC 6000 fileserver with UNIDATA SDM/WXP graphics system; a microcomputer cluster networked with IBM fileserver; a completely instrumented weather station; radio and television studios for broadcast-oriented students; computerized campus weather display system. There is an active programme of undergraduate research primarily in the area of synoptic/dynamic meteorology. Exceptional upper-division students may be selected for Plymouth State College Undergraduate Research Fellowships amounting to a tuition waiver for a semester. Meteorology internships are available at the National Weather Service Offices in Concord, New Hampshire and Portland, Maine, the Mount Washington Observatory, and at television stations WNEV and WBZ, Boston. There is also an active student chapter of the American Meteorological Society on campus which is responsible for engaging speakers and organizing field trips.

Entry: University admission.

USA-10	University of Virginia	TEL:	(804) 924-7761
Contact	University of Virginia, Clark Hall	FAX:	(804) 982-2137
Address:	Department of Environmental Sciences	E-M/tlx:	
	CHARLOTTESVILLE, Virginia 22903, USA		

USA-10-1 Key-words: MET Scientific Cl. 1a-1c UnivE-ET&R 4 years Annual English 1995

Course Title: *Environmental Programme: Bachelor of Arts, M.Sc., Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: The Greenhouse Effect and Public Policy; Synoptic Climatology; Chemistry, Resources and Environment; Introduction to Mesoscale Meteorology; Climates of Hunger; Land Use and Environmental Models; Man's Atmospheric Environment; Chemistry of Natural Waters; Atmosphere and Weather; Introduction to Tropical Meteorology; Atmosphere and Weather Laboratory; GIS Methods; Introduction to Climatological Analysis; Weather of the Rain Forest; Land Use Management. GRADUATE COURSES: Air quality Planning; Mesoscale Atmospheric Circulations; Atmospheric Dynamics; Tropical Meteorology; Principles of Microclimate; Climate Ecosystem Dynamics; Physical Oceanography; Environmental Chemistry; Environmental Climatology; Global Biogeochemical Cycles.

In addition to a full undergraduate programme, the Department offers graduate degree programmes leading to the Master of Science and Doctor of Philosophy, emphasizing basic research of a disciplinary nature. The faculty offers a wide range of graduate courses in the above areas, as well as weekly seminars featuring invited speakers. Additionally, the Fred Holmsley Moore lectures bring distinguished speakers to the Department to lecture on issues of broad environmental concern. Students have the opportunity of pursuing their own research questions or of participating in faculty research programmes.

The Department of Environmental Sciences is an academic department in the College of Arts and Sciences, offering instruction and conducting research in the areas of Atmospheric Sciences, Hydrology, Ecology and Geology. This unique juxtaposition of several sciences in one Department fosters cooperation and exchange among traditional disciplines that share similar methodological and philosophical problems. The research endeavours of both faculty and graduate students, whether disciplinary or interdisciplinary, deal largely with problems of fundamental scientific interest and to a lesser extent with applied science, management or policy making. The Department is located in Clark Hall, along with the Science and Engineering Library, on the central grounds of the University. Additional laboratory space is located in Halsey Hall. Departmental facilities include field vehicles, boats, flumes, a wind tunnel, machine and electronics shops, digital and analog computers, computer terminals, DIFAX weather information line, PC Mcldas, UNIDATA, Domestic and International Data systems, national Weather Wire, Lightning Detection Network, GOES-tap satellite receiver, Virginia Weather Wire Service, FAA current weather information, and word processors. The Office of the Virginia State Climatologist is located within the Department and is the central archive for Virginia state climate data, as well as a wide variety of U.S. and international data sets on various media. In addition, the Department has access to other University facilities such as IBM and UNIX mainframe computers.

Entry: University admission.

USA-11	University of Missouri-Columbia	TEL:	(314) 882-6591
Contact	University of Missouri-Columbia	FAX:	(314) 884-5133
Address:	School of Natural Resources	E-M/tlx:	C514842@mizzou1.missouri.edu
	UCAR Member, 100 Century Hall		
	COLUMBIA, MISSOURI 65211, USA		

USA-11-1 Key-words: MET Scientific Cl. 1a-1c UnivE-ET&R 4 years Annual English 1995

Course Title: *Atmospheric Science Programme: B.Sc., M.Sc., Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Introductory Meteorology; Remote Sensing for Meteorology; Weather Briefing; Atmospheric Physics; Independent Study in Atmospheric Science (Staff); Fundamentals of Meteorology; Daily Analysis and Forecast Interpretation; Micrometeorology; Meteorology of the Biosphere; Climates of the World; Meteorological Analysis I; Internship in Meteorology; Meteorological Analysis II; Atmospheric Thermodynamics and Statics; Atmospheric Phenomena in Physical & Earth Science Instruction; Atmospheric Kinematics and Dynamics; Topics in Atmospheric Science; Long-Range Forecasting.

GRADUATE COURSES: Problems, Independent Study in Atmospheric Science; Advanced Dynamic

...Meteorology; Topics in Atmospheric Science; Atmospheric General Circulation; Radiation Transfer in the Atmosphere; Advanced Dynamic Climatology; Atmospheric Science Seminar; Graduate Research in Atmospheric Science.

CORRESPONDENCE COURSE: Introductory Meteorology.

The computer facilities available for atmospheric research include workstations, a mainframe computer for batch entry at the Academic Computer Center, the NCAR computer system, and occasional use of a corporate utility computer. Long-term global, regional and local observation records are available to support the research effort in dynamic atmospheric modelling, general circulation, and climatic variability. The general circulation research is focused on long-range forecasting with both numerical and empirical approaches. Series of model experiments on the long-range simulation of winter and summer atmospheric blocking are performed and analyzed. An empirical seasonal range forecasting scheme is being developed for the Midwest. Global climate change research is actively pursued in collaboration with National Biological Survey. The mesoscale circulation research focuses on cumulus dynamics and the geographic and time variability of tornadoes and severe thunderstorms. Research is continuing concerning the numerical evaluations of cyclonic and frontal circulations with the implications to numerical prediction. A strong interdisciplinary educational and research relationship exists within the environmental disciplines in the School of Natural Resources.

Entry: University admission.

USA-12	Indiana University	TEL: (812) 855-6303
Contact:	Indiana University	FAX: (812) 855-1661
Address:	Student Building 120, Department of Geography Climate and Meteorology Program BLOOMINGTON, IN 47405-6101, USA	E-Mail: GRIMMON@indiana.edu

USA-12-1 Key-words: MET Operational Cl.1a-1c UnivE-Clima 4 years Annual English 1995

Course Title: *M.A., M.A.T., M.A./M.S.E.S. (With School of Public and Environmental Affairs), Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Physical Systems of the Environment; Dynamic Meteorology I; Weather and Climate; Dynamic Meteorology II; Meteorology and Physical Climatology; Internship (e.g. National Weather Service); Environmental Remote Sensing; Micrometeorology & Physical Climatology I; Field Methods in Physical Geography; Micrometeorology & Physical Climatology II; Hydroclimatology; Advanced Climatological Instrumentation and Field Methods; Climate Dynamics; Advanced Climatology and Meteorology; Synoptic Meteorology I; Atmospheric Data Analysis; Synoptic Meteorology II.

GRADUATE COURSES: Hydroclimatology; Seminar; Advanced Physical Geography; Mathematical Modeling in Climatology; Synoptic Meteorology I; Satellite Climatology; Synoptic Meteorology II; Climate Change and Variability; Dynamic Meteorology I; Statistical Climatology; Dynamic Meteorology II; Meso-Scale Processes; Micrometeorology and Physical Climatology I; Boundary Layer Meteorology; Micrometeorology and Physical Climatology II; Urban Micrometeorology; Advanced Climatology and Meteorology; Readings in Climatology; Advanced Climatological Instrumentation and Field Methods; M.A./M.S.E.S. Research Papers; Atmospheric Data Analysis; M.A. Thesis; Ph.D. Thesis.

CORRESPONDENCE COURSES: Physical Systems of the Environment; Weather and Climate; Environmental Conservation.

The department has formal relationships with the National Weather Service (NWS) offices at Indianapolis, Louisville, and Fort Wayne. Students receive practical training in NWS procedures as a part of a volunteer programme agreement. Research in climatology at Indiana University is enhanced by the on-campus site of the Midwestern regional center of the National Institute for Global Environmental Change and the Indiana Center of Global Change and World Peace. The existence of these institutions provides funding opportunities and institutional support for research in climate variability. In addition, the Department of Geography maintains close ties with the Illinois State Water Survey and Midwest Regional Climate Center (Urbana-Champaign). Departmental computer facilities include IBM and Macintosh computers, plotters, digitizers, and laser printers, HP workstations, three Sun workstations, and an ERDAS image processing system. The university computing system includes a series of computer labs, including Sun Workstations, GIS and computer mapping, as well as several DEC VAX 8000 and 6000 series minicomputers, and two 15 IBM RS/6000 machines, and an Intel paragon parallel computer. Field equipment includes: two remote weather stations and micro-meteorological instrumentation (sonic anemometer thermometers, krypton hygrometers, airsonde-tethersonde system, bowen ration system, radiation equipment, temperature, wind speed and direction, precipitation measuring equipment).

Entry: University admission.

USA-13	University of Colorado at Boulder	TEL:	(303) 492-7167
Contact	University of Colorado	FAX:	(303) 492-3822
Address:	Program in Atmospheric and Oceanic Sciences	E-M/tlx:	pjw@willywilly.colorado.edu
	Campus Box 311		
	BOULDER, Colorado 80309-0311, USA		

USA-13-1 Key-words: MET Operational Cl. 1a-1c UnivE-Bases 4 years Annual English 1995

Course Title: *Aerospace Engineering Sciences Department: M.Sc., Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Dynamic Earth 3 - Meteorology and Oceanography; Photochemistry of the Earth's Upper Atmosphere; Aviation Meteorology; Photochemistry of Planetary Atmospheres; Atmospheric Science 1: Meteorology; Planetary Atmospheres; Atmospheric Science 2: Climatology; Dynamics of Fluids; The Earth's Atmosphere and Oceans; Physical Climatology-Principles; Planets and their Atmospheres; Oceanography; Computational Fluid Mechanics.

GRADUATE CORE COURSES: Physical Processes of the Atmosphere and Ocean; Thermodynamics of the Atmosphere and Ocean; Dynamics of the Atmosphere and Ocean; Remote Sensing of the Atmosphere and Ocean; Atmospheric Chemistry; Radiative Processes in Planetary Atmosphere.

Entry: Applicants must have a bachelor's degree with a strong background in physics and mathematics. A background in meteorology or in physical oceanography is not necessary but is an asset.

USA-14	North Carolina State University	TEL:	(919) 515-3717
Contact	North Carolina State University	FAX:	(919) 515-7802
Address:	Department of Marine, Earth and Atmospheric Sciences	E-M/tlx:	Leonard_Pietrafesa@ncsu.edu
	Box 8208		
	RALEIGH, NC 27695, USA		

USA-14-1 Key-words: MET Scientific Cl. 1a UnivE-Bases 4 years Biannual English 1995

Course Title: *Meteorology Programme: B.Sc.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Physical Climatology; Meteorology Lab I; Physical Meteorology; Meteorology Lab II; Atmospheric Dynamics I; Climatology Data Analysis; Atmospheric Physics; Atmospheric Dynamics II; Weather Analysis and Forecasting I; Micrometeorology; Weather Analysis and Forecasting II; Air Pollution Meteorology; Introduction to Weather & Climate; Introduction to Weather & Climate Lab; Natural Hazards and Global Change; Introduction to Environmental Geography; Introduction to Oceanography; Introduction to Oceanography Lab; Air Quality.

Entry: High School Diploma, SAT scores.

USA-15	State University of New York at Brockport	TEL:	(716) 395-2636
Contact	State University of New York at Brockport	FAX:	(716) 395-2416
Address:	Department of the Earth Sciences	E-M/tlx:	RWEINBEC@ACSPR1.ACS.BROCKPORT.EDU
	350 New Campus Drive		
	BROCKPORT, NY 14420-2936, USA		

USA-15-1 Key-words: MET Operational Cl. 1a UnivE-Bases 4 years Annual English 1995

Course Title: *Bachelor of Science, Bachelor of Arts in Meteorology and in Water Resources*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Introduction to Oceanography; Fluid Mechanics; Weather; Aviation Meteorology; Synoptic Meteorology; Weather Forecasting; Biological Oceanography; Computational Methods in the Field Sciences; Water Resource Issues; Hydrology Laboratory; Hydrology; Environmental Climatology; Environmental Climatology Laboratory; Physical Meteorology; Thermodynamics and the Boundary Layer; Dynamic Meteorology; Watershed Management; Atmospheric Sensing Methods; Air Pollution Meteorology; Tropical Meteorology; Mesoscale Dynamics; Oceanography Practicum; Meteorological Internship; Water Quality Studies; Environmental Internship; Meteorological Communications; Weather Briefing; Seminar on Meteorological Problems; Geomorphology; Groundwater.

The Department is located in the Smith-Lennon Sciences complex, housing classrooms, laboratories, research space and offices, and the College Weather Center. The Earth Sciences Computing Network consists of two Hewlett-Packard and nine Sun RISC workstations, a COMET multimedia workstation as

well as several PCs and a GRASS geographic earth information systems computer. The Network accesses several environmental data streams including Unidata McIDAS, Difax and Domestic Data Plus via satellite, commercial Rochester 5-cm radar and local instrumentation. Portable atmospheric profiling equipment, analog recording instrumentation and extensive equipment for laboratory analyses enhance field studies that are an important component of departmental courses. The Geology and Earth Science Club and a student chapter of the American Meteorological Society are based here. The Bahamas Oceanography Practicum and environmental, meteorological and communications internships offer unique, off-campus learning experiences. An interdisciplinary minor in Communications Meteorology is offered for students wishing to become informed communicators of earth systems information to mass audiences.

Entry: University admission.

USA-16	Saint Louis University	TEL:	(314) 977-3115
Contact	Saint Louis University	FAX:	(314) 977-3117
Address:	Department of Earth and Atmospheric Sciences	E-M/tlx:	rao@eas.slu.edu
	3507 Laclede Avenue		
	ST. LOUIS, Missouri 63103-2010, USA		

USA-16-1 Key-words: MET Scientific Cl. 1a-1c UnivE-ET&R 4 years Annual English 1995

Course Title: *Bachelor of Arts, B.Sc., M.Sc., Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Understanding the Weather; Climate and Humankind in History; Global Change; Introduction to the Atmospheric Sciences; Introduction to Synoptic and Remote Sensing; Map and Chart Analysis; Physical Climatology; Synoptic Meteorology Laboratory; Intermediate Synoptic Laboratory; Elements of Air Pollution; Meteorological Data and Instrumentation; Micrometeorology; Physical Meteorology; Principles of Dynamic Meteorology I; Principles of Dynamic Meteorology II; Internship; Senior Inquiry Research Project.

GRADUATE COURSES: Numerical Methods of Prediction; Boundary Layer Meteorology; Tropical Meteorology; Synoptics-Dynamics-Jet Stream; Meteorology of Severe Storms; Diagnosis and Prediction of Severe Storms; Mesometeorology; Physical Meteorology; Principles of Radiation Transfer I; Turbulence; Advanced Meteorology Laboratory; Satellite Meteorology; Radar Meteorology; Convection; Research Seminar; Graduate Reading Course; Thesis Research; General Circulation of the Atmosphere; Graduate Reading Course; Dissertation Research.

Five SUN SPARC 5 Workstations are available for instruction and two SUN SPARC Classics are available for research and teaching. A meteorological observing station is fully operational on the roof of the building. Meteorological data (DDS+, McIDAS, HRS, IDS and WSI-Doppler) and maps (DIFAX) were received through a satellite dish, but as of March 1995 have been transmitted through internet via UNIDATA.

Entry: University admission.

USA-17	Purdue University	TEL:	(317) 494-3258
Contact	Professor Ernest M. Agee, Purdue University	FAX:	(317) 496-1210
Address:	Department of Earth and Atmospheric Sciences	E-M/tlx:	
	1397 Civil Engineering Building		
	West Lafayette, IN 47907-1397, USA		

USA-17-1 Key-words: MET Operational Cl. 1a-1c UnivE-ET&R 4 years Annual English 1995

Course Title: *Meteorology Programme: B.Sc., M.Sc., Ph.D.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: The Profession of Meteorology; Introduction of Atmospheric Science; Laboratory in Atmospheric Science; Atmospheric Observations and Measurements I; Aviation Meteorology; Topics in Atmospheric Science; Physical Oceanography; Application of Microcomputers to Meteorology; Atmospheric Thermodynamics; Atmospheric Dynamics I; Atmospheric Dynamics II; Introduction to Satellite Meteorology; Synoptic Laboratory I; Synoptic Laboratory II; Synoptic Laboratory III; Weather Analysis and Forecasting.

GRADUATE COURSES: Atmospheric Physics I; Atmospheric Physics II; Tropical Meteorology; Boundary Layer Meteorology; Cumulus Dynamics; Theory of Climate; Atmospheric Observations and Measurements II; Atmospheric Chemistry; Radar Meteorology; Atmospheric Measurement Systems; Advanced Topics in Atmospheric Science; Atmospheric Remote Sensing; Cloud Physics; General Circulation of the Atmosphere; Synoptic Scale Dynamics; Numerical Modeling of Atmospheric Systems;

Mesoscale Meteorology; Geofluid Dynamics in a Rotating System; Atmospheric Radiation; Atmospheric Fluid Dynamics; Seminar in Atmospheric Sciences; M.Sc. Thesis Research; Ph.D. Thesis Research.

The Atmospheric Science Program is complemented by FAA604, DDS, DIFAX, GOES, PROFILER and NOAA-NWS real-time radar data services, along with a number of computer workstations that allow for access, processing and graphical display. Dedicated laboratories of IBM PowerPC and RS6000 workstations support teaching and research activities in synoptic meteorology, mesometeorology, and climate studies. Access to supercomputers at the National Center for Atmospheric Research and NASA-Goddard Space Flight Center are available via Internet connectivity. Teaching and research activities also are served by a Meteorological Field Observing Facility from which basic weather data are telemetered to the department. This field facility also serves for testing new instrumentation and for the acquisition of meteorological data streams via a satellite receiving station for both observations and predictions. Synoptic laboratory classes emphasize interactive computing and display, which are enhanced by image processing, overlay of graphical displays of various meteorological fields along with radar and satellite movie-looping capability, all of which require and utilize the computing skills of both the undergraduate and graduate student body. The building complex of the Department includes state-of-the-art teaching and research laboratory facilities. In addition, resources are available for conducting research in agrometeorology, biometeorology, micrometeorology and atmospheric chemistry.

Entry: University admission.

USA-18 Saint Louis University

TEL: (618) 337-7500

Contact: Dr Larry A. Viehland

FAX: (618) 332-6802

Address: Parks College of Saint Louis University
Department of Science and Mathematics
CAHOKIA, Illinois 62206, USA

E-Mail: viehland@ions.sli.edu

USA-18--1 Key-words: MET Operational Cl. 1a UnivE-Bases 4 years Annual English 1995

Course Title: *B.Sc. in Aeronautics-Meteorology*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Introduction to the Earth Sciences; Advanced Dynamic Meteorology; Air Pollution Meteorology; Hydrology; Weather; Severe Local Storms; Forecasting; Synoptic Meteorology I; Physics of the Atmosphere; Research Problems; Dynamic Meteorology; Synoptic Meteorology II; World Climate; Thesis; Physical Processes in the Atmosphere.

It is anticipated that the meteorology programmes at Parks College of Saint Louis University and in the College of Arts and Science of Saint Louis University will be merged in the fall of 1997.

Entry: University admission.

USA-19 San Jose State University

TEL: (408) 924-5200

Contact: San Jose State University

FAX: (408) 924-5191

Address: Department of Meteorology
1 Washington Square
SAN JOSE, California 95192-0104, USA

E-Mail: PBLMODEL@SJSUVM1.SJSU.EDU

USA-19--1 Key-words: MET Operational Cl. 1a-1c UnivE-Bases 4 years Annual English 1995

Course Title: *Meteorology Programme: B.Sc., M.Sc.*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Weather and Climate; Weather Seminar; Computers in Meteorology; Meteorology I; Meteorology II; Writing Workshop: Meteorological Reports; Atmospheric Science Laboratory; Atmospheric Science; Global Climate Changes; Atmospheric Pollution; Dynamic Meteorology I, II; Advanced Climatology; Thermodynamics & Radiation; Physical Meteorology; Boundary Layer Meteorology; Air Pollution Meteorology; Meteorology of the Oceans; Empirical Techniques in Meteorology; Computers in Meteorology; Tropical Meteorology; Meteorological Instruments; Weather Briefing I, II; Synoptic Weather Analysis and Forecasting I, II; Mesoscale Meteorology; Senior Research Project; Individual Studies; Special Topics; Air Dispersion Lab I.

GRADUATE COURSES: Advanced Atmospheric Dynamics I, II; Advanced Synoptic Meteorology; Turbulence; Advanced Physical Meteorology; Biometeorology; Numerical Modeling; Boundary Layer Modeling; Recent Developments in Meteorology; Seminar; Research; Master Thesis or Project.

Facilities include a fully instrumented rooftop observatory and synoptic laboratory with a complete data acquisition system, a satellite data receiving system, and a local interactive computer system for research and instruction. In addition, a large inventory of equipment is available for micrometeorological studies.

The department is a repository for NESDIS Satellite Data and has a large archive of surface and upper-air maps and data. Faculty and students have many opportunities to participate in cooperative research efforts with local universities, private research institutes and governmental agencies. Currently these include Lawrence Livermore National Laboratory, NASA-Ames Research Center, SRI International, Naval Environmental Prediction Research Facility, Lawrence Berkeley Laboratory, University of California at Berkeley, and National Weather Service.

Entry: University admission.

USA-20	San Francisco State University	TEL: (415) 338 2061
Contact	San Francisco State University	FAX: (415) 338-7705
Address:	Department of Geosciences	E-Mail: montever@sfsu.edu .
	1600 Holloway Avenue	
	SAN FRANCISCO, CA 94132, USA	

USA-20--1 Key-words: GEO Operational Cl. 1a-1c Unive-ET&R 4 years Annual English 1996

Course Title: *Bachelor of Arts in Science: Concentration in Meteorology; M.Sc. in Applied Geosciences*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

UNDERGRADUATE COURSES: Introduction to Meteorology; Introduction to Meteorology Lab; Introduction to Oceanography; Introduction to Oceanography Lab; Fundamentals of Physical, Dynamic and Synoptic Meteorology; Basic Weather Chart Analysis; Introduction to Use of Computers in Meteorology; The Violent Atmosphere and Ocean; California Weather Events; Introductory Atmospheric Physics; Introductory Atmospheric and Oceanic Dynamics; Weather Analysis and Forecasting; Meteorological Observing Techniques and Systems; Fortran Programming in Meteorology; California Weather Analysis; Atmospheric-Ocean Interactions; Advanced Satellite Analysis Techniques; Intermediate Atmospheric Dynamics; Advanced Weather Analysis and Forecasting; Introductory Cloud Physics; Weather Chart Discussion; Explorations in Consulting Meteorology; Cooperative Education in Meteorology; Senior Project; Public Weather Forecasting; Special Study.

GRADUATE COURSES: Quantitative Methods in Applied Geosciences; Research Methods in Geosciences; Seminar in Applied Geosciences Topics; Advanced Weather Chart Discussion; Advanced Weather Satellite Analysis Techniques; Atmospheric and Oceanic Dynamics of Coastal Zones; Analysis and Prediction of Severe Storms; Physics of the Atmosphere-Ocean Interface, Synoptic Meteorology of Midlatitude Oceans; Directed Reading; Research Project; Master's Thesis.

The meteorology programme at San Francisco State University is an integral part of the Geosciences Department and emphasizes an interdisciplinary approach to the study of air-sea interactions. San Francisco is an active participant of the Moss Landing Marine Laboratories, located approximately 100 miles south of San Francisco in Monterey Bay operated by a consortium of six members of the California State University System. The laboratories offer course and research opportunities in a variety of marine sciences for physical science majors. In addition, the University operates the Romberg Tiburon Center on San Francisco Bay, 30 miles north of the main campus. The Romberg Center serves multidisciplinary instructional and research facility for the study of the natural and human environment of San Francisco Bay and the central California coast. The Department of Geosciences conducts joint research projects with scientists at nearby NASA Ames Research Center as well as the National Weather Service. The core facility of the meteorology curriculum is the NSF-funded UNIX-based Weather Graphics and Simulation Laboratory (WGSL). The WGSL provides real-time weather charts, satellite images, Doppler radar images and forecasts. Charts and images of special interest to West Coast meteorologists are being made available through the World Wide Web's California Regional Weather Server (<http://squall.sfsu.edu>) which is also accessible through the Department's Web Site (<http://tornado.sfsu.edu/geosciences/geosciences.html>).

Entry: University admission.

YEMEN, The Republic of

YEM-1	Civil Aviation Institute Khormaksar Aden	TEL:	(967-1) 31 548
Contact	The Director General of	FAX:	
Address:	Civil Aviation Department	E-M/tx:	2285AD
	P.O. Box 424, ADEN		
	Republic of Yemen		

YEM-1-1 Key-words: MET Observation Cl. 4 ProfF-Bases 12 months Ad hoc Arabic,E 1988

Course Title: *Meteorological Observer*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

General Meteorology, earth science, method of observation, pilot balloon observations, coding and decoding observations, plotting of surface and upper-air charts, plotting of tephigrams, preparation of climatological returns, preparation of broadcasts.

This course is especially for local students who will be employed in Meteorological Services.

Entry: Completion of secondary education, with good knowledge of mathematics, physics and English.

YUGOSLAVIA, The Federal Republic of

YUG--1 Hydrometeorological Service, Belgrade

Contact Permanent Representative with WMO
Address: Federal Hydrometeorological Institute
Bircaninova 6, P.O. Box 604
11.001 BELGRADE, Yugoslavia

TEL: (381-11) 645 779

FAX: (381-11) 646 369

E-Mail: 129.37

YUG--1-1 Key-words: MoH Operational Cl.1b ProfS-Rfrsh Flexible Ad hoc Serbian 1988

Course Title: *Training for meteorological and hydrological personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Main subjects: synoptic meteorology; aeronautical meteorology; meteorological instruments; climatology; agricultural meteorology; hydrology and hydrological instruments; meteorological observations; marine meteorology; meteorological and hydrological publications.

Entry: University admission.

YUG--2 University of Belgrade

Contact Permanent Representative with WMO
Address: Federal Hydrometeorological Institute
Bircaninova 6, P.O. Box 604 ;11.001 BELGRADE
cc: Univ. of Belgrade, Faculty of Natural Sciences

TEL: (381-11) 645-779

FAX: (381-11) 646-369

E-Mail: 129.37

YUG--2-1 Key-words: MET Scientific Cl.1a-1c UnivF-ET&R 2-4 years Annual Serbian 1988

Course Title: *Training of professional meteorologists, (Dipl. Met., M.Sc. and Ph.D.)*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

FIRST YEAR (Undergraduate Meteorology): rigid-body mechanics (lectures and laboratory work); mathematics; fluid mechanics, heat and sound; sociology.

SECOND YEAR: electricity and magnetism; mathematics; general meteorology; light and modern physics.

THIRD YEAR: probabilities and statistics; equations of mathematical physics; dynamical meteorology I; micrometeorology; and at least three of the following elective courses: hydrology; meteorological instruments and observation; programming; climatology; inorganic chemistry; or, other courses, with the permission of the Department.

FOURTH YEAR: dynamical meteorology II; weather analysis; numerical methods in dynamical meteorology; philosophy or pedagogy; and at least three of the following elective courses: applied meteorology; weather forecasting; weather and climate over Yugoslavia; cloud physics; or other courses with the permission of the Department.

GRADUATE METEOROLOGY: Courses for graduate study are available in the following fields: dynamical meteorology; numerical weather prediction; turbulence; weather analysis over Yugoslavia; atmospheric electricity; cloud physics; radiation; climatology; meteorological instruments.

Duration: Dipl. Met.: four years; M.Sc.: two years of study beyond Diploma of Meteorology degree is required, or the same degree in mathematics, physics, astronomy and mechanics. M.Sc. thesis prerequisite: at least average grade mark 8 (eight) during undergraduate study. Ph.D.: it takes one or two years of research work to prepare the Ph.D. thesis. Foreign languages: it is expected, normally, that a student preparing for M.Sc. or Ph.D. degree knows two foreign languages, such as: English, Russian, German or French.

Entry: High school of Natural Sciences.

ZAMBIA, The Republic of

ZMB--1 Zambia Air Services Training Institute

Contact: The Director
Address: Meteorological Department
P.O. Box 30200
10101 LUSAKA, Zambia

TEL: (260-1) 252 728

FAX: (260-1) 252 728

E-M/tlx: ZA 40762

ZMB--1--1 Key-words: MET Observation Cl.4 ProfE-AbIni 9 months Annual English 1995

Course Title: *Meteorological Observers Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Principles of General Meteorology; Meteorological Instruments; Weather Observation and Reporting; Surface and upper-air plotting; Relationship with other aviation organizations; Meteorological Telecommunication procedures; Mathematics and Physics; Communication skills; Simulator training.

International trainees accepted. For tuition and boarding fees applicable each year, kindly contact the Principal, ZASTI.

Entry: GCE (ordinary level) with mathematics, physics/general science and English.

ZMB--1--2 Key-words: MET Operational Cl.4 ProfS-Natnl 13 weeks Ad hoc English 1995

Course Title: *Meteorological observer refresher course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Meteorological Instruments; Weather Observation and Reporting; Upper-air Observations; Climatology; Administration of meteorological stations; Communication skills; Agrometeorology.

This course is mainly for national trainees. The course syllabus can be changed to suite national meteorological needs, as required.

Entry: Class IV meteorological personnel.

ZMB--1--3 Key-words: MET AssistForec Cl.3 ProfE-Advan 1 year Annual English 1995

Course Title: *WMO Class III Meteorological Course*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

Dynamic, Physical, Synoptic and Aeronautical Meteorology; Climatology; Meteorological Instruments; Chart Plotting and Analysis; Agrometeorology; Mathematics; Physics; Pilot Weather Briefing; Simulated Course.

International trainees accepted. For tuition and boarding fees applicable each year, kindly contact the Principal, ZASTI.

Entry: WMO Class IV Meteorologist Certificate. GCE (ordinary level) with mathematics, physics/general science and English.

ZIMBABWE, The Republic of

ZWE-1	Department of Meteorological Services, Harare	TEL: (263-4) 704 955
Contact	Head of Forecast Branch	FAX: (263-4) 733 126
Address:	Department of Meteorological Services P.O. Box BE 150, Belvedere HARARE, Zimbabwe	E-M/tlx:

ZWE-1-1 Key-words: MET PredictForec Cl.2 ProfF-Bases 2 years Ad hoc English 1995

Course Title: *Preparation of WMO Class II personnel*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

FIRST ACADEMIC YEAR, Major Subjects: 1. MATHEMATICS: General Mathematics and Algebra; Calculus (Differential and Integral); Trigonometry; Geometry (Analytical and Spherical); Applied Mathematics (Differential Equations and Vector Analysis; Statistics and Probability); 2. PHYSICS: Heat; Optics; Electricity; Acoustics; Properties of Matter; Practical Physics; Thermodynamics; Hydrodynamics and Mechanics; 3. COMPUTING and DATA PROCESSING: Introduction to Computers; Numerical Analysis; Computer Programming; 4. GENERAL METEOROLOGY: Introduction.
SECOND ACADEMIC YEAR, Major Subject: METEOROLOGY and ATMOSPHERIC SCIENCES: Synoptic Meteorology; Physical Meteorology; Dynamic Meteorology; Thermodynamics and Hydrodynamics; Tropical Meteorology; General Circulation; Micrometeorology; Agrometeorology; Aeronautical Meteorology; Climatology and Data Processing; Numerical Weather Prediction; Weather Analysis and Forecasting; Marine Meteorology; Hydrometeorology; Upper-air Meteorology; Introductory Biometeorology; Atmospheric Chemistry; Atmospheric Remote Sensing; Weather Discussion and Briefing; Seismology; Interpretation and Application of NWP products and satellite imagery; and A Research Project.

Entry: At least 5 "O" level GCE passes including English, mathematics and any science subject and/or GCE "A" level passes in mathematics and physics, or WMO Class III Certificate.

ZWE-1-2 Key-words: MET Technician Cl.3 ProfF-Synop 6 months Ad hoc English 1995

Course Title: *Training Meteorological Observers and Assistant Forecasters; WMO Class III*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

THERMODYNAMICS of the atmosphere; Psychrometric formula; Theory and use of tephigram; Moisture indicators; Cloud, fog and precipitation; Methods of formation of different types of clouds; Artificial rain. DYNAMIC METEOROLOGY: Geostrophic wind; Thermal wind; Vertical divergence and convergence. SYNOPTIC METEOROLOGY: Air masses; Fronts; Frontal depressions; Tornadoes, Tropical cyclones. LOCAL WIND CIRCULATIONS: Sea and land breezes; Influence of mountains; Foehn effects. GENERAL CIRCULATION of the atmosphere: Monthly and annual mean charts, their uses; Zonal index; Jet streams; Wind and temperature fields near a jet; Types of jet streams; Tropical meteorology; General circulation at low latitudes; ITCZ; Trade winds and monsoons; Easterly waves line squalls. ATMOSPHERIC OPTICS and ELECTRICITY: Lightning and thunderstorms. ELEMENTARY STATISTICS and CLIMATOLOGICAL METHODS: Data processing; Checking of returns; Climatology of Southern Africa and adjacent ocean areas. METEOROLOGICAL INSTRUMENTS: Barometer and its corrections; Autographic instruments; Sunshine recorder; Evaporation pan; Hydrogen generator.

Entry: At least 5 "O" level GCE passes including English, mathematics and any science subject and/or WMO Class IV Certificate.

ZWE-1-3 Key-words: MET Observation Cl.4 ProfF-AbIni 6 months Annual English 1995

Course Title: *Basic Meteorological Training for Observers*

Course Syllabus and Additional Information (e.g. aims of the course, schedule, facilities, accommodation, fees, etc.):

THE EARTH ATMOSPHERE: meteorological elements; clouds and weather; weather forecasting; climate and climatology; agricultural meteorology, aviation weather services; WMO functions, role. VISUAL OBSERVATIONS: observations for aviation; codes; reduction of pressure. PLOTTING of surface and upper-air synoptic charts and tephigrams. PILOT balloon ascents. INSTRUMENTS: operations and use. DAILY REGISTER: climatological returns; reduction of autographic charts. METEOROLOGICAL TELEPRINTER, basic operation.

Entry: At least 3 "O" Level GCE passes including English, mathematics and any science subject.

WMO DATABASE-COMPENDIUM OF TRAINING FACILITIES FOR METEOROLOGY AND
OPERATIONAL HYDROLOGY; Course Standard Form.

Country Name:		CountryID:	ABC	Colour:	xxxx
Contact Address:		TEL:		FAX:	
		E-Mail/Telex/Telegramme:			
Course Title:					
CourseID:	ABC-1-1	Class:		InstitutionID:	ABC-1
Field:		Activity:		Duration:	
Language:		Emphasis:		Frequency:	
Educational Facility:					
Entrance Qualification:					
Course Syllabus :					
Additional Information:					

To facilitate database updating, please fill in this form and forward it to the WMO Education and Training Programme (ETRP). Alternatively, for updating through Internet, please consult the ETRP page : <http://www.wmo.ch>

PARTIE II

Introduction

SIGNIFICATION DES COULEURS

La conception initiale de la publication obligatoire intitulée "*Compendium of Training Facilities for Meteorology and Operational Hydrology*" (*Recueil de renseignements sur les possibilités de formation en météorologie et hydrologie opérationnelle*, OMM-N° 240) a été révisée compte tenu de l'évolution rapide des systèmes d'enseignement dans le monde et des progrès considérables enregistrés ces dernières années dans le domaine de l'informatique (matériel et logiciel). Il a été aussi tenu dûment compte de la très grande diversité des expériences et des circonstances - d'un pays à l'autre ou à l'intérieur d'un même pays - et en particulier du fossé technologique entre les pays, ainsi que de la préférence de certains Membres pour telle ou telle langue de travail de l'OMM et, ce qui est moins courant, du fait que dans un même pays, tous les établissements d'enseignement n'optent pas pour la même langue.

Pour tenir compte de ces facteurs contraignants, tout en maintenant telles quelles (à part quelques modifications de forme) la formulation et la teneur des renseignements initiaux fournis par les Membres, un système à quatre couleurs a été conçu, reflétant d'une manière générale l'usage effectif des langues de communication de l'OMM. Si l'on considère que certains pays ont officiellement choisi et utilisé plus d'une langue de ce type, le système adopté est plus restrictif en ce sens qu'une seule couleur est assignée à chaque pays. Par ailleurs, il faut bien noter que ces couleurs sont utilisées exclusivement aux fins de la présente publication et n'ont aucune signification politique ou autre.

Le présent *Recueil de renseignements sur les possibilités de formation en météorologie et hydrologie opérationnelle*, établi à partir d'une base de données Access 2.0, intègre simultanément trois langues de travail de l'OMM : l'anglais, l'espagnol et le français. En raison des difficultés techniques que pose l'utilisation d'un alphabet cyrillique pour l'exploitation de la base de données, le russe, l'autre langue de travail de l'OMM, doit encore être inclus. Par conséquent, la publication est divisée en quatre parties et les couleurs assignées comme suit : Partie I : *anglais-bleu*, mots clefs et autres informations en anglais; Partie II : *français-rose*, mots clefs et autres informations en français; Partie III : *russe-vert*, mots clefs en anglais et (la plupart des) autres informations en russe; Partie IV : *espagnol-jaune*, mots clefs et (la plupart des) autres informations en espagnol. Il faut toutefois souligner que cette convention ne signifie pas nécessairement que la langue d'enseignement est l'anglais, l'espagnol, le français ou le russe. Par exemple, la couleur bleue correspond non seulement à des cours dispensés en anglais mais aussi à des cours donnés dans les langues locales des divers pays qui préfèrent l'anglais comme langue de travail de l'OMM. De même la couleur jaune indique non seulement les cours dispensés en espagnol mais aussi les cours donnés en portugais ou même en anglais (lorsque priorité a été donnée au groupe linguistique dominant, hispanophone ou lusophone).

Chacune des parties comporte deux chapitres :

Chapitre 1 : Index des cours

Chapitre 2 : Liste des établissements et résumé des cours

Les brèves notes explicatives qui accompagnent chaque chapitre sont les mêmes dans toutes les parties, mais les données/informations contenues dans une partie sont totalement différentes de celles contenues dans les autres, par exemple, les données/informations contenues dans une partie n'existent pas dans les autres parties.

La présente publication contient des renseignements sur 545 cours dispensés dans 233 établissements d'enseignement de 95 pays, selon la répartition ci-après :

	Partie I — Bleu	Partie II — Rose	Partie III — Vert	Partie IV — Jaune
Pays :	65	13	4	13
Etablissements :	168	25	10	30
Cours :	375	68	37	65

Une "check list", à laquelle il est fait systématiquement référence, a été conçue pour faciliter l'utilisation du Recueil et l'extraction des renseignements contenus dans la base de données. Cette liste type contient huit éléments d'information, à savoir : le domaine scientifique, l'activité visée, la classe de personnel, la nature du cours, la durée du cours, la périodicité du cours, la langue d'enseignement et la date de fourniture des informations. Pour rationaliser et harmoniser les informations fournies par les divers établissements d'enseignement, même dans un contexte multinational, on a conçu pour chaque rubrique une série limitée de mots clefs.

A la fin de chaque partie est annexé un formulaire standard. On pourra en utiliser des exemplaires, en particulier pour communiquer au Secrétariat de l'OMM des informations mises à jour.

Chapitre 1

INDEX DES COURS

Notes explicatives sur la signification du code d'identification du cours (Course ID)

Comme les informations figurant dans les pages suivantes sont présentées par ordre alphabétique anglais des noms de pays et par ordre croissant des codes d'identification des cours (Course ID), on trouvera ci-dessous une brève description des codes assignés aux pays, aux établissements et aux cours dans la base de données :

- CountryID :** Ensemble de trois lettres permettant de codifier le nom du pays (formule générique: ABC). Les codes (voir la table des matières la liste des pays qui fournissent les renseignements) reposent sur les désignations adoptées par l'Organisation internationale de normalisation. Voir le bulletin de terminologie N° 347; Nations Unies, New York, 1995, Publication de l'ONU N° ISBN 92-1-002063-4.
- InstitutionID :** Ensemble de six caractères servant à désigner l'établissement d'enseignement sous les auspices duquel le cours est organisé (formule générique: ABC--1).
- CourseID :** Ensemble de neuf caractères servant à numérotter les cours en fonction des établissements qui les dispensent (formule générique : ABC--1--1).

Les six premiers caractères du code d'identification du cours (CourseID) correspondent au code d'identification de l'établissement d'enseignement (Institution ID), tandis que les trois premiers caractères de ce dernier correspondent au code d'identification du pays (Country ID).

Index des cours

CourseID	Titre du cours	(Sélection "Rose" seulement)
AFGHANISTAN, The Islamic State of		
AFG-1-1	Météorologie et Hydrologie	
ALGERIA, The People's Democratic Republic of		
DZA-1-1	Formation des météorologistes des classes I, II, III, IV	
DZA-1-2	Hydrométéorologie	
BELGIUM, The Kingdom of		
BEL-1-1	Stages de formation pratique ou de perfectionnement en météorologie/hydrométéorologie	
BEL-2-1	Maîtrise ou Certificat en sciences de l'environnement, option agrométéorologie	
BEL-3-1	Licence spéciale en hydrologie	
BEL-4-1	Licence spéciale en sciences géophysiques	
CAP-VERDE, The Republic of		
CPV-1-1	Météorologie synoptique, aéronautique et maritime	
FRANCE; The French Republic		
FRA-1-1	Ingénieurs météorologistes de classe I	
FRA-1-2	Formation initiale des ingénieurs de la météorologie	
FRA-1-3	Formation initiale des ingénieurs des travaux de la météorologie	
FRA-1-4	Formation initiale des techniciens supérieurs de la météorologie - filière "exploitation"	
FRA-1-5	Formation initiale des techniciens supérieurs de la météorologie - filière "instruments et installation"	
FRA-1-6	Mastère spécialisé (M.S.) en météorologie options "modélisation numérique" et "météorologie tropicale"	
FRA-1-7	Traitement des données météorologiques (Prévision numérique)	
FRA-1-8	Météorologie tropicale et applications (Module de spécialisation de Classe 1)	
FRA-1-9	Météorologie dynamique (module de spécialisation de Classe 1)	
FRA-1-10	Météorologie physique (module de spécialisation de Classe 1)	
FRA-1-11	Climatologie (module de spécialisation de Classe 1)	
FRA-1-12	Techniques de l'ingénieur météorologiste (module de spécialisation de classe 1)	
FRA-1-13	Agrométéorologie	
FRA-1-14	Analyse numérique	
FRA-1-15	Capteurs de base	
FRA-1-16	Capteurs aéronautiques	
FRA-1-17	Système de traitement et de contrôle "CASTOR"	
FRA-1-18	Ecole d'été de statistiques	
FRA-1-19	Radar GEMATRONIK	
FRA-1-20	Interprétation de l'imagerie satellitale	
FRA-1-21	Mesures en altitude, système STAR	
FRA-1-22	La mesure de la pression atmosphérique	
FRA-1-23	La mesure de la température et de l'humidité de l'air	
FRA-1-24	Météorologie aéronautique	
FRA-1-25	Météorologie marine	
FRA-1-26	Météorologie tropicale (niveau avancé)	
FRA-1-27	Météorologie tropicale (niveau de base)	
FRA-1-28	Nivologie	
FRA-1-29	Radar RODIN	
FRA-1-30	Statistiques de base	

FRA-1-31	Bases en téléinformatique
FRA-1-32	Traitement numérique du signal
FRA-2-1	DEA Océan, Atmosphère, Biosphère
FRA-3-1	Météorologie et Climatologie
FRA-4-1	Option "système climatiques" d'un DEA cohabilité , Interface océan/atmosphère et téléconnexions; Variabilité climatique - Topoclimatologie - Climato-tropicale
FRA-5-1	Physique et chimie de l'atmosphère
FRA-5-2	Cycle d'eau et flux d'énergie
FRA-5-3	Option "Processus physiques du climat" dans la cadre du DEA "Climat et physico-chimie de l'atmosphère"
FRA-6-1	Hydrologie et eaux de surface
FRA-7-1	Formation complémentaire en Hydrologie

MADAGASCAR, The Republic of

MDG-1-1	Formation d'ingénieurs de la météorologie
MDG-1-2	Formation de techniciens supérieurs en météorologie

MOROCCO, The Kingdom of

MAR-1-1	Formation conduisant au grade d'adjoint technique spécialisé (ATS) - Classe III avancée
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NIGER, The Republic of the

NER-1-1	Formation des ingénieurs des travaux en hydrologie
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RWANDA; The Rwandese Republic

RWA-1-1	Météorologie
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SWITZERLAND; The Swiss Confederation

CHE-1-1	Climatologie.
CHE-1-2	Le climat et l'homme; climat et établissements humains
CHE-2-1	Physique de l'atmosphère
CHE-3-1	Introduction à la climatologie et à la météorologie.
CHE-3-2	Météorologie régionale.
CHE-3-3	Etudes d'impact sur l' environnement atmosphérique

TUNISIA, The Republic of

TUN-1-1	Ingénieur des travaux de l'Etat - Classe II
TUN-1-2	Technicien supérieur
TUN-1-3	Adjoint technique, Classe III

VIET NAM, The Socialist Republic of

VNM-1-1	Cours de formation des météorologistes et hydrologistes des classes I et II
VNM-1-2	Cours de formation des météorologistes de la classe III
VNM-1-3	Cours de formation des hydrologistes des classes I et II
VNM-1-4	Cours de formation des hydrologistes de la classe III

ZAIRE, The Republic of

ZAR-1-1	Cours de météorologie/agrométéorologie/hydrométéorologie - Diplôme d'études supérieures (classe II)
ZAR-2-1	Cours de météorologie sanctionnée par un diplôme d'études secondaires - Classe III

LISTE DES ÉTABLISSEMENTS ET RÉSUMÉ DES COURS

Pour chaque pays contribuant à la présente publication, le premier titre est le nom usuel du pays (en anglais). Le premier paragraphe contient l'adresse du principal établissement d'enseignement, qui est le plus souvent le bureau de formation du Service météorologique et hydrologique national. Les paragraphes suivants contiennent des renseignements sur les cours organisés sous les auspices de l'établissement en question. La rubrique consacrée au premier établissement d'enseignement est suivie le cas échéant par d'autres rubriques consacrées à d'autres établissements d'enseignement. Puis viennent les informations relatives aux pays suivants, qui sont présentées selon le même modèle.

Domaine scientifique	Activité visée	Classe de personnel	Nature du cours	Durée du cours	Périodicité du cours	Langue d'enseignement	Date de fourniture des informations
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Domaine scientifique : Code à trois lettres désignant l'un des cinq principaux domaines scientifiques se rapportant directement à la météorologie et/ou à l'hydrologie, à savoir :

MÉT Météorologie, sciences de l'atmosphère et applications se rapportant à l'influence du temps et du climat sur de nombreux aspects de l'agriculture, du commerce et de l'industrie; voir aussi la rubrique "Technoclimatologie" dans le *Vocabulaire météorologique international* (publication de l'OMM - N° 182, 1992);

HYD	Hydrologie opérationnelle, sciences de l'eau et applications se rapportant à l'influence du cycle hydrologique sur de nombreux aspects de l'agriculture, du commerce et de l'industrie;
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MoH	Applications conjuguées de la météorologie et de l'hydrologie opérationnelle, y compris des études hydrométéorologiques et des applications technoclimatologiques connexes;
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ENV Sciences de l'environnement et applications liées à celles de la météorologie et de l'hydrologie opérationnelle dont elles diffèrent cependant; cette rubrique englobe les applications relatives aux changements climatiques mais non les sciences du climat;

GEO Sciences géophysiques, en particulier l'étude des fluides géophysiques; cette rubrique englobe des études climatologiques dont la portée dépasse celle de la "climatologie de l'atmosphère" de la rubrique MET.

Activité visée : Il s'agit des compétences que le stagiaire est censé acquérir. Comme les programmes de formation portent sur de nombreux domaines de compétence, les huit références "codées" ci-après, qui se rapportent également à la classe de personnel ont été retenues :

Scientifique	Recherche et développement, enseignement théorique; classe 1, essentiellement 1c;
Prévision	Etablissement des prévisions principales; classes 1-2, essentiellement 1a ou 1b;
Aideprévi	Assistance aux prévisionnistes et/ou adaptation des prévisions principales; classes 2-3;
Technicien	Activité technique particulière à l'appui des activités d'exploitation quotidiennes; classes 2-3;
Observation	Observation météorologique/hydrologique d'exploitation; classes 3-4;
InstrumEquip	Manipulation/maintenance des instruments, des moyens de télécommunication et des ordinateurs; classes 1-4;
Opérationnel	Terme général désignant toute activité courante s'inscrivant dans la "chaîne de prévision"; classes 1-4;

Cihymet	Applications climatologiques/hydrologiques/météorologiques en dehors de la "chaîne de prévision"; classes 1-4.
Classe de personnel :	Code composé essentiellement de chiffres décrivant la classe de personnel (1, 2, 3, 4) de l'OMM à former. Le personnel de la classe 1 est lui-même subdivisé en trois sous-catégories :
1a	Etudes universitaires d'au moins quatre ans dans le domaine concerné, sanctionnées par un diplôme;
1b	Etudes universitaires supérieures ne débouchant pas sur un titre universitaire;
1c	Etudes universitaires supérieures sanctionnées par une maîtrise ou un doctorat.

Classes combinées : Exemples :

1a-1c	Programme de formation s'adressant à des étudiants diplômés ou non;
1-4	Formation pratique s'adressant à toutes les classes de personnel confondues;
1a-2	Cours auquel peut assister le personnel des classes 1a et 2; etc.
Nature du cours :	Code composite, partiellement chiffré, de onze caractères se présentant sous la forme xxxxx-yyyyy, où :
xxxxx	représente le <i>type d'enseignement</i> , qu'il s'agisse d'études universitaires classiques (à désigner par le préfixe Univ) ou d'une formation professionnelle extra-universitaire (à désigner par le préfixe Prof). Plus précisément, le code xxxxx doit être constitué par le préfixe Univ ou Prof suivi du suffixe E, F ou S - pour Enseignement, Formation ou Spécialisation.
yyyyy	est l'abréviation qui correspond soit à la <i>spécialité professionnelle</i> soit au <i>niveau d'enseignement</i> ; voir la liste des exemples types ci-après.

Spécialisation		Niveau d'enseignement	
<i>Aerol</i>	Observation/étude aérologique	<i>Elem</i>	Formation élémentaire
<i>Aeron</i>	Météorologie aéronautique	<i>Sup</i>	Formation supérieure; généralement de type universitaire, par opposition à "Speci" ci-dessous
<i>Agric</i>	Météorologie agricole	<i>Base</i>	Formation de base, assez semblable au programme de formation décrit dans la Publication N° 258 de l'OMM
<i>Atmos</i>	Sciences de l'atmosphère et applications		
<i>Clima</i>	Climatologie; sciences du climat	<i>ET&R</i>	Enseignement, formation et recherche
<i>DataP</i>	Traitement des données en M & H	<i>IDisc</i>	Cours inter/pluridisciplinaire
<i>DynaM</i>	Météorologie dynamique	<i>Intro</i>	Cours d'introduction
<i>Elect</i>	Instr/matériel électroniques	<i>Inten</i>	Cours intensif
<i>Engin</i>	Ingénierie	<i>Intnl</i>	Cours international; stagiaires étrangers
<i>Envir</i>	M & H de l'environnement	<i>Intrm</i>	Cours intermédiaire
<i>HyMet</i>	Hydrométéorologie	<i>Gestion</i>	Gestion des ressources en eau ou gestion administrative
<i>Instr</i>	Instruments classiques et méthodes d'observation	<i>Natnl</i>	Cours destiné aux ressortissants du pays
<i>Marin</i>	Météorologie maritime	<i>FST</i>	Formation sur le tas
<i>NclPP</i>	Centrale nucléaire	<i>R&D</i>	Recherche et développement
<i>Ocean</i>	Océanographie	<i>Recycl</i>	Cours de recyclage, formation périodique; rejoint en partie les rubriques "Sup" et "Speci"
<i>PhysM</i>	Météorologie physique	<i>Rech</i>	(le plus souvent) recherche fondamentale dans le domaine des sciences de l'atmosphère/de l'océan
<i>Pollu</i>	Pollution de l'atmosphère/des eaux		
<i>Radar</i>	Météorologie radar	<i>Speci</i>	Spécialisation; formation axée sur l'aspect pratique, par opposition à la rubrique "Sup" ci-dessus
<i>SateM</i>	Météorologie satellitaire	<i>Divers</i>	Niveau d'enseignement non précisé
<i>Synop</i>	Météorologie synoptique		
<i>Telec</i>	Télécommunications météorologiques		
<i>Water</i>	Spécialisation dans le domaine de l'eau		

Pour un cours donné, un seul suffixe peut être choisi dans les deux colonnes ci-dessus.

Durée du cours :	Indication du nombre de cours, d'heures, de jours, de semaines, de mois, de trimestres, de semestres ou d'années universitaires nécessaires pour mener à terme le programme d'enseignement. Le terme moins précis "flexible" est parfois utilisé.
Périodicité du cours :	Les abréviations utilisées - Trimest, Semest, etc. - se passent de commentaires. Le mot clef Ad-hoc désigne une activité de formation qui n'est pas organisée de façon régulière, sans être nécessairement ponctuelle; il s'agit en fait d'une formation qui est dispensée lorsque le besoin s'en fait sentir.

Langue d'enseignement :	Il en existe une trentaine. Parfois, lorsque l'enseignement peut être dispensé non seulement dans la langue nationale mais aussi en anglais, espagnol, français ou russe, les lettres A, E, F ou R sont adjointes comme suffixes à la langue d'enseignement.
Date de fourniture des informations :	Date/moment où ont été fournies les informations; seule l'année est indiquée dans la ligne des mots clefs figurant dans les pages consacrées aux différents pays, mais la version informatisée donne la date complète.
Adresse :	(Principal) établissement sous les auspices duquel le cours ou le module d'enseignement est organisé. A chaque établissement correspond bien sûr une seule adresse et donc un seul code d'identification (InstitutionID).
Courrier électronique/ téléx/câble :	Adresse de courrier électronique ou, à défaut, numéro de téléx ou code de câble, selon les cas.
Téléphone :	Numéros disponibles.
Fac-simile :	Numéros disponibles.

AFGHANISTAN, The Islamic State of

AFG-1 Faculté de géophysique, Université de Kaboul

TÉL: (873-68) 62.318

Adresse : Autorité hydrométéorologique afghane
Relations extérieures, Khawaja Rawash,
P.O. Box 2020, KABOUL, Afghanistan
CC: Faculté de géophysique, Univ. de Kaboul.

FAX:

E-M/tlx: 243.74 AMD AF

AFG-1-1 Mots-clé: MoH Opérationnel Cl. 1a UnivF-HyMet 4 ans Annuel Dari 1988

Titre du cours : *Météorologie et Hydrologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

LES SUJETS COMMUNS : Base d'hydromécanique; Cartographie; Géographie d'Afghanistan; Géodésie; Météorologie générale; Géophysique; Hydrologie générale; Physique; Mathématiques.

EN MÉTÉOROLOGIE : Météorologie synoptique; Astronomie; Météorologie dynamique; Météorologie aéronautique; Agrométéorologie; Climatologie; Statistiques; Aérologie; Méthodes d'observation et instruments; Ordinateur; Chimie de l'atmosphère; Rôle de la météorologie dans l'économie; Méthodes aériennes en météorologie; Conservation de l'atmosphère; Synoptique locale.

EN HYDROLOGIE : Introduction des rivières; Hydrophysique; Technique de la sécurité et recherches techniques; Base d'hydraulique et construction hydrométrique; Calcul hydrologique; Bilan d'eau; Prévision hydrologique; Ordinateur; Méthodes aériennes en hydrologie; Statistiques en hydrologie; L'économie de l'eau et ses calculs; Rôle de l'hydrologie dans l'économie nationale; Conservation et exploitation efficace des ressources en eau.

Les étrangers ayant les conditions d'admission peuvent s'inscrire, si leur demande arrive officiellement par la voie de notre ministère des affaires étrangères. Frais : Gratuit.

Admiss.: Baccalauréat, après avoir subi un concours général.

DZA-1 Institut Hydrométéorologique de Formation et de Recherche, Oran

Adresse : Institut hydrométéorologique de formation et de recherches (IHFR)
BP 7019 ; HAI IBN-ROCHD SEDDIKIA
ORAN, Algérie

tél: (213-6) 45 12 10

fax: (213-6) 45 13 12

e-mail/tlx: 22034 DZ

DZA-1-1 Mots-clé: MET Opérationnel Cl. 1a ProfE-Bases 24 mois Ad-hoc Français 1997

Titre du cours : *Programme d'Enseignement du cycle Ingénieur d'Etat*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Complément de mathématiques; Thermodynamique classique; Rayonnement; Mécanique des fluides; Introduction à la météorologie; Statistiques; Programmation; Analyse numérique; Hydrostatique et thermodynamique de l'atmosphère; Météorologie dynamique; Prévision numérique; Météorologie Synoptique; Physique des nuages; Observation en surface et en altitude; Prévision Statistique; Météorologie des basses-couches; Climatologie; Anglais; Arabe; Hydrologie; Transmission; Circulation générale; Météorologie tropicale; Instrumentation Météo; Météorologie aéronautique; Phénomènes locaux; Météorologie agricole; Chimie de l'atmosphère; Pollution.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de première graduation ou diplôme de classe II de l' OMM.

DZA-1-2 Mots-clé: MoH Opérationnel Cl. 1a ProfE-HyMet 18 mois Ad-hoc Français 1997

Titre du cours : *Programme d'Enseignement du cycle Ingénieur d'Application*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Mathématiques; Electricité; Géographie-Géodésie; Introduction à la Météorologie; Transmission; Programmation; Analyse numérique; Electronique; Instruments; Thermodynamique; Mécanique générale; Météo physique; Météo dynamique; prévision numérique; Météo synoptique; Probabilités/Statistiques; Turbulence et basses couches; Observation en surface; Observation en altitude; Climatologie; Hydrologie; Agrométéorologie; Physique des nuages; Météorologie aéronautique; Météorologie tropicale; Météorologie marine; Arabe; Anglais; Complément de français; Droit administratif et législation financière.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: BAC Science ou Diplôme de la classe III de l'OMM.

DZA-1-3 Mots-clé: MET Opérationnel Cl. 1a-2 ProfF-Bases 30 mois Ad-hoc Français 1997

Titre du cours : *Programme d'Enseignement du cycle Technicien Supérieur Option Exploitation*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Mathématiques; Mécanique générale; Electricité I; Thermodynamique; Géographie; Instruments; Transmissions; Informatique; Anglais; Français; Nuages; Météorologie générale; Observation en surface; Observation en altitude; Probabilités/Statistiques; Climatologie; Météorologie agricole; Météorologie marine; Météorologie aéronautique; Météorologie tropicale; Cartographie; TP Instruments.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: BAC Sciences.

DZA-1-4 Mots-clé: MET Opérationnel Cl. 2 ProfF-Bases 24 mois Ad-hoc Français 1997

Titre du cours : *Programme d'Enseignement du cycle Technicien Supérieur Option Exploitation*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Mathématiques (Analyse, Algèbre, Géométrie); Physique; Electricité; Géographie; Instruments; Transmissions; Pratique des mesures en altitude; Nuages et météores, systèmes nuageux; Météorologie générale; Climatologie; Cartographie; Micrométéorologie; Observation en surface & codes; Météorologie tropicale; Météorologie aéronautique; Arabe; Français; Anglais.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Terminale Science ou Diplôme de la classe IV de l' OMM.

DZA-1-5 Mots-clé: MET Operationnel Cl.3 ProfF-Bases 18 mois Ad-hoc Français 1997

Titre du cours : *Programme d'Enseignement du cycle Aide Technicien*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Mathématiques; Physique; Chimie; Géographie; Arabe; Français; Météorologie générale; Instruments; Nuages, météores et systèmes nuageux; Codes; Cartographie; Météorologie agricole; Climatologie; Transmissions; Observation en surface; Observation en altitude; Administration;

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Fin du premier cycle du secondaire.

DZA-1-6 Mots-clé: MET Opérationnel Cl.1c-2 ProfF-Bases 2 semaines Ad-hoc Français 1997

Titre du cours : *Formation en Hydro-Climatologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

MODULE 1: Traitement d'une série climatologique:

Principaux paramètres statistiques utilisés en climatologie; Etude du caractère aléatoire simple d'une série; Ajustement - but, principe et application; Représentation graphique des données climatologiques;

MODULE 2: Application multidimensionnelle à la climatologie:

Corrélation et contingence; Analyse harmonique; Analyse spectrale; Chaîne de Markov; Utilisation des programmes d'application: CLICOM et INSTAT.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de classe 1 et classe 2.

DZA-1-7 Mots-clé: MET Opérationnel Cl.3 ProfS-CompS 2 semaines Ad-hoc Français 1997

Titre du cours : *Formation en Micro-Informatique*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Système d'exploitation MS-DOS; Language de programmation - BASIC ou PASCAL; Les utilitaires; Traitement graphique de l'information; Logique informatique; Travaux pratiques

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de classe III de l'OMM.

DZA-1-8 Mots-clé: MET Opérationnel Cl.2 ProfS-SateM 2 semaines Ad-hoc Français 1997

Titre du cours : *Stage en Imagerie Satellitaire*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Les lois fondamentales du rayonnement; Le transfert radiatif; Le comportement de l'atmosphère; Le système METEOSAT; Familiarisation avec les images en VIS et IR; Méthodes d'estimation des précipitations.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de classe II de l'OMM.

DZA-1-9 Mots-clé: MET Opérationnel Cl.2 ProfS-Tropi 3 semaines Ad-hoc Français 1997

Titre du cours : *Météorologie Tropicale et Saharienne*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Présentation du stage; Planning (Circulation générale de l'atmosphère; Climatologie des régions tropicales; TP - données climatiques africaines; La ZCIT (FIT); Régimes d'hiver et d'été; TP - analyse de cartes types; Phénomènes particuliers; Techniques de prévision tropicale; Présentation par chaque stagiaire d'un thème -

mini mémoire; Programme de conférences; Documentaires scientifiques; Documentation remise à chaque stagiaire.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de classe II de l'OMM.

DZA-1-10 Mots-clé: MET Opérationnel Cl.2 ProfS-Agric 3 semaines Ad-hoc Français 1997

Titre du cours : *Stage en Agrométéorologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Rappel théorique; Instrumentation agrométéorologie; Agrométéorologie; Travaux pratiques.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de classe II de l'OMM.

DZA-1-11 Mots-clé: MET Opérationnel Cl.2 ProfS-Instr 3 semaines Ad-hoc Français 1997

Titre du cours : *Instruments Météorologiques*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Rappels sur les instruments météorologiques; Atelier d'entretien - laboratoires, procédures d'étalonnage des instruments météorologiques; Instruments - Barométrie, Thermométrie, Humidité, Vent.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de classe II de l'OMM.

DZA-1-12 Mots-clé: MET Opérationnel Cl.1-2 ProfS-Prévi 3 semaines Ad-hoc Français 1997

Titre du cours : *Analyse multidimensionnelle des données et prévision statistique*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Introduction à l'analyse des données - rappel de statistique; Analyse en composantes principales; Analyse des proximités - analyse canonique; Classification automatique; Analyse de régression - prévision statistique; Analyse discriminante; Exemples en agrométéorologie; conclusion générale.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de classe I et classe II de l'OMM.

DZA-1-13 Mots-clé: MET Opérationnel Cl.2-3 ProfS-Aeron 3 semaines Ad-hoc Français 1997

Titre du cours : *Assistance Aéronautique*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de classe II ou de classe III de l'OMM.

DZA-1-14 Mots-clé: MET Opérationnel Cl.2 ProfS-Clima 3 semaines Ad-hoc Français 1997

Titre du cours : *Stage en Traitement des données météorologiques*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Apprentissage informatique; Traitement et analyse de données climatologiques; Traitement de données pouvant provenir du GTS - exemple décodage de messages GRID ou autre; Mise sous forme de fichier de données climatologiques.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de classe II de l'OMM.

DZA-1-15 Mots-clé: MET Opérationnel Cl.2 ProfS-Admin 3 semaines Ad-hoc Français 1997

Titre du cours : *Stage Qualification Chef de Station*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

PARTIE I - SURFACE: Rappels; Tenue de documents climatologiques;

PARTIE II - ALTITUDE: Rappel théorique; Tenue de documents d'altitude;

PARTIE III - ADMINISTRATION: Relation avec la hiérarchie; relation avec autres administrations.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de classe II de l'OMM.

DZA-1-16	Mots-clé: MET Opérationnel	Cl.2	ProfS-Prévi	3 semaines	Ad-hoc	Français	1997
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Titre du cours : *Stage Qualification Chef Prévision*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Rappels théoriques - météorologie générale; Produits de modèles; Imagerie satellitaire; Prévision générale; Initiation à la micro-informatique; Relations administratives.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de classe II de l'OMM.

DZA-1-17	Mots-clé: MET Opérationnel	Cl.2-3	ProfS-Agric	3 semaines	Ad-hoc	Français	1997
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Titre du cours : *Stage en Agrométéorologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Rappel théorique; Instrumentation agrométéorologie; Agrométéorologie; Travaux pratiques.

Les admissions se font par le canal des ambassades algériennes dans les pays concernés ou par l'intermédiaire des ministères des affaires étrangères - Secrétariat à la coopération.

Admiss.: Diplôme de classe II ou de classe III de l'OMM.

BELGIUM, The Kingdom of

BEL-1 Institut royal météorologique de Belgique

Adresse : Monsieur le Directeur
Institut royal météorologique de Belgique
Avenue Circulaire, 3
B-1180 BRUXELLES, Belgique

TÉL: (32-2) 373-0501
FAX: (32-2) 375-1259
E-Mtx: METEORB 213.15

BEL-1-1 Mots-clé: MoH Opérationnel Cl. 1b-4 Proff-Bases Flexible Ad hoc Flamand,F 1988

Titre du cours : *Stages de formation pratique ou de perfectionnement en météorologie/hydrométéorologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Des stages peuvent être organisés pour les domaines suivants : Météorologie dynamique, physique ou synoptique; Analyse et prévision numérique; Climatologie; Hydrométéorologie; Instruments météorologiques; Traitement des données météorologiques; Aspects météorologiques de la pollution; Données météorologiques satellitaires; Géomagnétisme; Physique de l'ionosphère.

Les programmes sont établis de commun accord entre l'IRM et le candidat au stage. L'IRM ne pouvant fournir aucune aide financière aux candidats au stage, ceux-ci sont priés de prendre toutes dispositions en vue d'obtenir des subsides (bourse p. ex.) couvrant toutes les dépenses liées à leur participation au stage (voyage, subsistance, etc.).

Admiss.: Diplômes d'enseignement secondaire, d'enseignement technique secondaire ou supérieur, d'enseignement universitaire, selon le cas.

BEL-2 Fondation universitaire luxembourgeoise à Arlon

Adresse : Fondation universitaire luxembourgeoise
140, rue des Déportés
B-6700 ARLON, Belgique

TÉL: (32-6) 322-0380
FAX:
E-Mtx:

BEL-2-1 Mots-clé: MET Clhymet Cl. 1b ProfE-Agric 7-12 mois Annuel Français 1988

Titre du cours : *Maîtrise ou Certificat en sciences de l'environnement, option agrométéorologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

PROGRAMME D'ÉTUDES varie en fonction de la qualification de base du candidat (météorologiste ou agronome), et selon que l'on veuille obtenir la Maîtrise ou le Certificat. Matières enseignées dans le cadre du programme en agrométéorologie (de janvier à juin, 225 heures de cours, 120 heures de travaux pratiques et de visites sur le terrain).

ÉLÉMENTS de physique nécessaires aux sciences de l'atmosphère; Météorologie et climatologie générales; Questions spéciales d'hydrométéorologie tropicale et leurs applications à l'agriculture; Agrométéorologie et développement; Introduction à la climatologie, à la pédologie et à la phytogéographie tropicales; Bases physio-chimiques et biologiques de l'agrométéorologie; Télémessure et télécommunication des paramètres agrométéorologiques; Interprétation synoptique, prévision et diffusion des informations météorologiques. LES MAÎTRISANTS doivent en outre suivre un programme pluridisciplinaire (de septembre à décembre) comportant notamment des cours sur l'écologie, le traitement des données, la géographie, la sociologie, l'économie, le droit, etc. (285 heures de cours, 45 heures de séminaires et de travaux pratiques; élaboration d'un Mémoire de recherche).

Durée des cours : Maîtrise en 12 mois, ou certificat en 7 mois. Date du début des cours : mi-septembre pour la Maîtrise; décembre pour le Certificat. L'OMM administre des fonds belges destinés à offrir des bourses à des candidats des pays en développement.

Admiss.: Maîtrise, être titulaire d'un diplôme d'ingénieur agronome ou d'ingénieur chimiste des industries agricoles. Certificat, être titulaire, au minimum, d'un diplôme de l'enseignement supérieur non universitaire (3 ans au moins) ou assimilé, en rapport avec les orientations de l'enseignement.

BEL-3 Institutions universitaires francophones de Bruxelles, Liège, Louvain et Mons

Adresse : Institut royal météorologique de Belgique,
Avenue Circulaire, 3, B-1180, BRUXELLES.
CC: Institutions universitaires francophones de :
Bruxelles, Gembloux, Liège, Louvain, Mons.

TÉL: (32-2) 373-0501
FAX: (32-2) 375-1259
E-Mtx: METEORB 213.15

Titre du cours : *Licence spéciale en hydrologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

COURS OBLIGATOIRES (415 heures) : Hydrométéorologie; Agrohydrologie; Hydrologie en milieu non saturé; Hydrologie de surface (physiographie, hydrométrie et météorologie, ruissellement, crues et étiages, transports solides, rivières à marées et estuaires); Hydrogéologie; Bilan et modèles de gestion; législation. **COURS à OPTION** (min. 150 heures) : Etude et prospection des eaux souterraines y compris les prospections géophysiques; Irrigation et drainage; Travaux hydrauliques, réservoirs de surface, barrages, etc.; Zone littorale et estuaire; Hydrologie urbaine, Réseaux d'égouts et stations d'épuration; Réseaux de distribution d'eau; Pollution et traitement des eaux; Aménagement du territoire; Informatique géologique et modèles mathématiques; Réalimentation des nappes aquifères; Hydrogéologie dans les ouvrages souterrains (mines, tunnels, etc.).

MÉMOIRE de fin d'études d'une importance d'environ 200 heures.

Renseignements complémentaires:

1. Université de l'Etat à Liège (UEL); Prof. A MONJOIE : Laboratoires de géologie de l'ingénieur ; Université de Liège à Sart-Tilman; B-4000 LIÈGE Belgique; (Tél.: 041 56 22 16).
2. Université catholique de Louvain (UCL); Prof. L. DE BACKER : Département du génie rural; Faculté des sciences agronomiques; Place Croix-du-Sud, 3; B-1348- LOUVAIN-LA-NEUVE; (Tél.: 010 41 81 81).
3. Université libre de Bruxelles (ULB); Prof. R. MONTEYNE : Laboratoires de géologie, Faculté des sciences; avenue Fr. Roosevelt, 50; B-1050 BRUXELLES; (Tél.: 02 642 29 46).
4. Faculté des sciences agronomiques de l'Etat (GBx); Prof. Mme. S. DAUTREBANDE : Département d'hydraulique et améliorations foncières; B-5800 GEMBLoux; (Tél.: 081 61 29 58).
5. Faculté polytechnique de Mons (FPMs); Prof. Y. GODFRIAUX : Département de géologie; B-7000 MONS; (Tél.: 065 33 81 91).

Droit d'inscription (1988) : 10.000-15.000 frs belges, selon le statut reconnu au pays d'où provient l'étudiant.

Admiss.: Licence universitaire belge en sciences appliquées, en sciences agronomiques, ou en sciences (équivalence du diplôme établie par le Comité organisateur).

BEL-4 Université libre de Bruxelles (U.L.B.)

TÉL: (32-2) 642-2946

Adresse : Observatoire royal de Belgique
Avenue Circulaire, 3; B 1080 BRUXELLES
CC: Université libre de Bruxelles, Fac. des sciences
Av. F. Roosevelt, 50, B-1050 Bruxelles, Belgique

FAX:
E-Mail:

Titre du cours : *Licence spéciale en sciences géophysiques*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Les étudiants auront à choisir deux modules parmi les trois qui sont proposés ci-dessous, ainsi qu'un minimum de deux cours à option, choisis soit parmi les cours repris dans les autres modules, soit parmi les options reprises à titre indicatif, soit parmi les cours figurant au programme de la Faculté des sciences et qu'ils n'ont pas suivis antérieurement.

MODULE 1, GÉOCHIMIE (130 h) : Géochimie théorique; Géochimie isotopique et géochronologique; Cosmochimie et planétologie; Océanographie chimique et géochimie des eaux.

MODULE 2, GÉOPHYSIQUE (153 h) : Physique du globe; Géophysique interne; Astrophysique théorique; Structure et évolution du manteau (à créer).

MODULE 3, PROSPECTION GÉOCHIMIQUE (161 h) : Prospection géochimique; Eléments d'hydrogéologie; Pédologie; Mécanisme géochimique de piégeage des substances utiles (à créer).

Durant l'année, l'étudiant devra s'intégrer, en concertation avec le Jury, dans un groupe de recherche d'un établissement ou d'un service spécialisé en vue d'y faire un stage de 80 heures minimum. Le choix des modules et des cours à option sera soumis à l'avis du Jury. L'ensemble des cours suivis, séminaires, exercices et travaux pratiques devra obligatoirement représenter 350 heures. Moyennant l'accord du Jury, les étudiants pourront être dispensés des épreuves sur les matières qui ont fait l'objet d'examens antérieurs subis avec succès. Equivalence du diplôme établie par le jury. Eventuellement suivre en complément quelques cours proposés par le jury parmi les cours de la faculté des sciences (mathématiques, physique, statistiques, par exemple). Frais (1988) : 10.000 frs belges, environ.

Admiss.: Etre titulaire d'un diplôme de licencié en sciences, d'ingénieur civil ou d'ingénieur agronome.

CAP-VERDE, The Republic of

CPV-1 Département de formation professionnelle du
Service météorologique portugais

TÉL: (238) 411 276

Adresse : Service météorologique national
CP 76 ILHA DO SAL,
Cap Vert

FAX: (238) 411 294

E-Mail: (993) 4036 ASASAL CV

CPV-1-1 Mots-clé: MET Observation Cl. 3-4 ProfF-Bases 6-24 mois Ad hoc Portugés 1988

Titre du cours : *Météorologie synoptique, aéronautique et maritime*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Les programmes publiés dans la publication No. 258 de l'OMM - Directives pour la formation professionnelle du personnel de la météorologie et de l'hydrologie opérationnelle.

Admiss.: Classe IV : avoir 9 années de scolarité. Classe III: avoir la Classe IV et trois années de pratique ou avoir 12 années de scolarité.

FRA-1 Ecole nationale de la météorologie, Toulouse

Adresse : Ecole nationale de la météorologie
Division de la formation permanente
42, avenue Gustave Coriolis
31057 TOULOUSE Cedex, France

tél: (33) 05 6107-9090
fax: (33) 05 6107-9630
e-mail/tlx: enm.fr@meteo.fr

FRA-1-1 Mots-clé: MET Scientif Cl. 1a UnivF-Bases 3 ans Annuel Français 1998

Titre du cours : *Ingénieurs météorologistes de classe I*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

LES DEUX PREMIÈRES ANNÉES : Enseignement scientifique de base; Enseignement théorique et pratique en météorologie; Technologie; Gestion et Communication; Informatique; Anglais. LA DERNIÈRE ANNÉE, spécialisation sur choix : Climatologie et agrométéorologie; Météorologie dynamique; Météorologie physique; Prévision numérique; Prévision opérationnelle; Recherche et développement.

Les sessions de formation débutent chaque année au début octobre. Les candidats doivent demander la fiche de candidature à l'ENM et la retourner avant la fin du mois de mars. Un jury se prononce sur l'admission directe, la nécessité de passer l'examen probatoire ou le rejet de la candidature. L'examen probatoire peut être organisé éventuellement dans le pays de chaque candidat. Les épreuves sont prévues généralement en juin. Un jury établit à la suite de l'examen la liste des candidats admis dans la formation. Dès l'admission prononcée, les candidats admis disposent d'un mois pour confirmer leur inscription. Possibilité de logement et de restauration à l'école.

Admiss.: Sur titre de niveau maîtrise (Baccalauréat + 4 années); sur examen de niveau Mathématiques spéciales.

FRA-1-2 Mots-clé: MET Scientif Cl. 1c UnivE-Super 2 ans Annuel Français 1998

Titre du cours : *Formation initiale des ingénieurs de la météorologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

ENSEIGNEMENT SCIENTIFIQUE ET TECHNIQUE centré sur l'étude de l'atmosphère, incluant cours, travaux pratiques et activités diverses d'approfondissement. MODULES DE FORMATION sur des thèmes relevant traditionnellement de "l'art de l'ingénieur" et plus ou moins spécifiques à la météorologie : informatique, modélisation numérique, météorologie opérationnelle et applications de la météorologie. STAGE PRATIQUE de deux semaines dans une unité territoriale de Météo-France ou dans un service météorologique étranger. ENSEIGNEMENT THÉORIQUE ET PROJET en statistiques et en climatologie. MODULE MANAGEMENT-GESTION: droit, gestion de projet, marketing, gestion des ressources humaines. STAGE DE RECHERCHE, sur les 6 derniers mois, dans une unité de recherche de Météo-France ou d'un autre organisme.

Possibilité de logement et de restauration sur le site de Météo-France de Toulouse; Début des cours vers le 15 septembre chaque année

Admiss.: Sur concours d'orientation scientifique; diplôme d'ingénieur ou de maîtrise exigé.

FRA-1-3 Mots-clé: MET Prévision Cl. 1a UnivF-Bases 3 ans Annuel Français 1998

Titre du cours : *Formation initiale des ingénieurs des travaux de la météorologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

- 1) Phase de sensibilisation à la météorologie et de découverte des activités correspondantes;
- 2) Enseignement scientifique fondamental;
- 3) Enseignement théorique et pratique en météorologie;
- 4) Travaux de synthèse : projets et stage de prévision;
- 5) Phase de spécialisation et stage d'approfondissement ou d'étude.

Possibilité de logement et de restauration sur le site Météo-France de Toulouse. Début des cours vers le 1er octobre chaque année.

Admiss.: Sur concours de niveau baccalauréat français + 2 années, et d'orientation scientifique.

FRA-1-4 Mots-clé: MET AidePrévisio Cl. 2 Proff-Spéci 2 ans Annuel Français 1998

Titre du cours : *Formation initiale des techniciens supérieurs de la météorologie - filière "exploitation"*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Enseignement de base dans des disciplines météorologiques et dans des matières d'intérêt général. Mise en oeuvre des connaissances acquises : assistance météorologique, ateliers, stage pratique, projet final.

Possibilités de logement et de restauration sur le site Météo-France de Toulouse; début des cours vers le 1er octobre chaque année.

Admiss.: Sur concours de niveau baccalauréat français et d'orientation scientifique. Diplôme du baccalauréat exigé.

FRA-1-5	Mots-clé: MET InstrumEquip	Cl.2	ProfF-Spéci	2 ans	Annuel	Français	1998
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Titre du cours : *Formation initiale des techniciens supérieurs de la météorologie - filière "instruments et installation"*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Techniques de base; Stage de découverte des activités de la météorologie; Techniques spécialisées pour la maintenance des équipements utilisés en météorologie; Techniques nouvelles; Atelier d'installation et de maintenance; Projet.

Possibilités de logement et de restauration sur le site Météo-France de Toulouse. Début des cours vers le 15 septembre chaque année.

Admiss.: Sur concours de niveau baccalauréat français et d'orientation technologique. Diplôme du baccalauréat exigé.

FRA-1-6	Mots-clé: MET Scientifique	Cl.1c	ProfS-Atmos	16 mois	Annuel	Français	1998
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Titre du cours : *Mastère spécialisé (M.S.) en météorologie options "modélisation numérique" et "météorologie tropicale"*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

1. ENSEIGNEMENTS ORAUX et TRAVAUX D'APPLICATION (Tronc commun et Options; septembre - mai) : TRONC COMMUN (septembre-mars). Enseignements oraux - 170 heures : Analyse numérique; Bases de la météorologie dynamique; Circulation générale de l'atmosphère; Convection et physique de l'eau atmosphérique; Couche limite atmosphérique; Introduction à l'activité météorologique; Météorologie générale; Météorologie tropicale; Océanographie générale; Transfert radiatif dans l'atmosphère; Travaux d'application - environ 170 heures de travaux dirigés et pratiques. OPTION "Modélisation numérique" (octobre-mai). Enseignements oraux - 170 heures : Adaptation statistique de sorties de modèles; Assimilation de données; Couplages climatiques; Couplages dynamico-chimiques; Informatique et gestion de projet informatique; Météorologie dynamique de l'atmosphère libre; Modélisation : principes et méthodes; Modélisation numérique du climat; Océanographie dynamique; Prévision par modèles numériques; Turbulence atmosphérique; Travaux d'application (sur chacune des options) - environ 70 heures de travaux d'application sous forme de mini-projet (étude bibliographique et/ou résolution de problème). OPTION "Météorologie tropicale" (octobre-mai). Enseignements oraux - 170 heures : Acquisition de données; Analyse et prévision en zone tropicale; Climat de la zone intertropicale; Composantes quasi permanente d'échelle régionale; Forçage diurne et circulations locales; Météorologie tropicale et société humaine; Modélisation; océanographie tropicale; Prévision climatique; Systèmes perturbés; Travaux d'application (sous forme de mini-projet) - environ 70 heures.

2. TRAVAIL PERSONNEL D'ÉTUDE et de RECHERCHE (juin-décembre) : Stage d'approfondissement de 6 mois effectifs se déroulant au sein d'une équipe travaillant sur la modélisation numérique en météorologie ou sur la météorologie tropicale, selon l'option choisie; remise d'un mémoire et soutenance orale devant un jury.

Examen de dossier (formulaire à demander à l'ENM); date limite - fin juin. Coût : 25 000 FF (étudiants : 10%). Logement et restauration possibles sur le site de l'ENM, Toulouse.

Admiss.: Diplôme universitaire ou d'ingénieur correspondant à 5 années d'enseignement supérieur (dérogations possibles : 20% des effectifs).

FRA-1-7	Mots-clé: MET Prévision	Cl.1b	ProfS-DataP	5 mois	Annuel	Français	1998
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Titre du cours : *Traitement des données météorologiques (Prévision numérique)*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

ANALYSE ET ASSIMILATION d'observations météorologiques (cours : 20 heures) : Généralités et définitions; Caractéristiques de l'atmosphère; estimation et filtre de Kalman; Assimilation variationnelle et

modèle adjoint; Contrôle de l'observation. **ANALYSE NUMÉRIQUE** (cours et travaux dirigés : 42 heures) : Introduction générale et présentation de la démarche suivie en analyse numérique; Résolution des systèmes linéaires (différentes méthodes); Problèmes elliptiques non linéaires (compléments) et méthodes de décomposition; Introduction à la technique des éléments finis; Equations d'évolution; Equations hyperboliques; Equations différentielles ordinaires; Equations non linéaires météorologiques (compléments); Méthodes spectrale pour des problèmes linéaires et non linéaires. **INFORMATIQUE** (cours, travaux dirigés et travaux pratiques : 51 heures) : Apprentissage de la programmation; les systèmes d'exploitation; Le génie logiciel; Infographie : le logiciel graphique "NCAR"; micro-informatique. **MODELISATION ATMOSPHERIQUE** (cours : 9 heures) : Généralités sur l'atmosphère et sa modélisation; Physique et modélisation atmosphérique; Exemples d'application de la modélisation atmosphérique; Aspects mathématiques de la modélisation; Présentation globale des modèles de Météo-France. **PREVISION NUMÉRIQUE** (cours : 20 heures) : Introduction; Représentation des champs en points de grille; Représentation barotrope filtré; Modèle barotrope en équations primitives; Etude générale de l'effet des diverses numérisations sur le modèle barotrope à équations primitives linéarisées; Présentation de la partie dynamique de divers modèles barclines; Le traitement des conditions aux limites et le filtrage; La partie physique des modèles; La mise en oeuvre des modèles opérationnels et les perspectives. **PROJET** de modélisation atmosphérique sur ordinateur (300 heures).

Examen de dossier (formulaire à demander à l'ENM); date limite - fin novembre. Coût : 16 000 FF; logement et restauration possibles sur le site de l'ENM, Toulouse.

Admiss.: Enseignement météorologique fondamental de Classe I (bonne connaissance de la météorologie dynamique).

FRA-1-8 Mots-clé: MET Clhymet Cl. 1b ProfS-Atmos 5 mois Annuel Français 1998

Titre du cours : *Météorologie tropicale et applications (Module de spécialisation de Classe 1)*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

CIRCULATIONS TROPICALES, étude théorique et descriptive (cours + travaux dirigés et pratiques : 70 heures). La circulation générale atmosphérique, CGA (25 h) : énergétique atmosphérique, équations dynamiques de la CGA, CGA observée, analyse d'échelle des mouvements atmosphériques tropicaux. Océanographie tropicale (20 h) : théorie de la dynamique de l'océan et observations de l'océan tropical. Météorologie régionale (12 h) : courants jets, alizés, moussons, zone de convergence intertropicale, forçage diurne et circulation locales. Climat de la zone intertropicale (13 h) : climats passés, climat actuel, variabilité interannuelle du système océan-atmosphère. **MÉTHODES D'INVESTIGATION** de l'atmosphère tropicale (cours : 71 h + travaux dirigés et pratiques : 55 h). Acquisition des données en météorologie tropicale (6 h) : télédétection satellitaire. Modélisation numérique (50 h) : techniques numériques, modèles de circulation générale, de prévision, de méso-échelle, paramétrisations, assimilation de données, contrôle des modèles. Analyse et prévision (15 h) : exploitation des données radar et satellite, et de produits numériques. **MÉTÉOROLOGIE TROPICALE ET SOCIÉTÉ HUMAINE** (cours : 18 h). Agrométéorologie tropicale (6 h). Hydrologie tropicale (6 h). Conférences sur des sujets d'actualité (6 h). **TRAVAIL PERSONNEL** (80 h). Synthèse bibliographique ou réalisation d'une étude.

Examen de dossier (demander formulaire à l'ENM); date limite - fin novembre. Coût : 14 000 FF; logement et restauration possibles sur le site de l'ENM, Toulouse.

Admiss.: Enseignement météorologique fondamental de Classe I.

FRA-1-9 Mots-clé: MET Scientifique Cl. 1b UnivS-DynaM 5 mois Annuel Français 1998

Titre du cours : *Météorologie dynamique (module de spécialisation de Classe 1)*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

COUPLAGES OCÉAN-ATMOSPHÈRE EN RÉGION TROPICALE (cours : 10 heures) : La place de la météorologie tropicale dans la circulation générale de l'atmosphère; analyse d'échelle; La couche limite tropicale; Instabilités; Circulations régionales; Les perturbations tropicales. **COUPLAGES DU SYSTÈME CLIMATIQUE** (cours : 10 heures) : Rétroactions entre température de surface et flux océan-atmosphère; Phénomène ENSO; Instabilités décennales de l'Atlantique Nord; Forçage radiatif net des nuages et températures de surface; Effets d'albédo glace/neige. **DYNAMIQUES DE L'ATMOSPHÈRE ET DE L'OCÉAN** (cours : 15 heures) : Les équations dynamiques et thermodynamiques des enveloppes fluides; Analyses d'échelles spatiales et temporelles; Les approximations hydrostatique et géostrophique; L'équation du vent thermique; L'équation de vorticité et ses approximations; Ecart au géostrophisme; Quelques solutions des équations sous forme d'ondes. **DYNAMIQUE DE LA BIOSPHÈRE** (cours : 10 heures) : Notions de base; Description et comportement d'un écosystème; Modèles simples pour les

biosphères continentales et océaniques; Forçages des écosystèmes; notions de couplage physique-chimie-biologie. **MÉTÉOROLOGIE DYNAMIQUE** (cours : 20 heures) : Les perturbations extratropicales; Ondes de relief; Introduction à la circulation générale. **OCÉANOGRAPHIE DYNAMIQUE** (cours : 20 heures) : Introduction à l'océanographie descriptive; Dynamique des courants; Equations primitives et approximations quasi-géostrophiques; Circulations des gyres, modélisation; Les ondes dans l'océan, circulation tropicale, solitons; Couche limite océanique. **INTERFACES OCÉAN-ATMOSPHÈRE ET SOL-ATMOSPHÈRE** - processus dynamiques (cours : 20 heures) : Notion de couche limite en géophysique; Régimes de stabilité; Equations de Boussinesq; Introduction à la turbulence; Bilan d'énergie aux interfaces; Mesure et paramétrisation des flux turbulents; Description phénoménologique de quelques couches limites; Equation pour l'énergie cinétique turbulente et ses applications. **TRAVAIL PERSONNEL** sur un sujet de météorologie dynamique et rédaction d'un **MÉMOIRE** (350 heures).

Examen de dossier (demander formulaire à l'ENM); date limite - fin juin. Coût : 13 500 FF; logement et restauration possibles sur le site de l'ENM, Toulouse.

Admiss.: Enseignement météorologique fondamental de Classe I.

FRA-1-10	Mots-clé: MET Scientifique	Cl. 1b	ProfS-PhysM	5 mois	Annuel	Français	1998
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Titre du cours : *Météorologie physique (module de spécialisation de Classe 1)*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Capteurs obliques et paramètres de surface (10 heures) ; Couplages océan-atmosphère en région tropicale (10 heures); Couplages du système climatique (10 heures); Cycles biogéochimiques (15 heures); Dynamique de la biosphère (10 heures); Effets radiatifs dans la couche limite (6 heures); Introduction au traitement du signal et des images (20 heures); Méthodes de mesure micro-ondes (10 heures); Nuages et électricité (25 heures); Observation spatiale de l'océan (10 heures); Processus dynamiques aux interfaces océan/atmosphère et sol/atmosphère (20 heures); Rayonnement et transfert radiatif (20 heures); Travail personnel sur un sujet de météorologie physique et rédaction d'un mémoire (300 heures).

Examen de dossier (demander formulaire à l'ENM); date limite - fin juin. Coût : 16 000 FF; logement et restauration possibles sur le site de l'ENM, Toulouse.

Admiss.: Enseignement météorologique fondamental de Classe I.

FRA-1-11	Mots-clé: MET Clhymet	Cl. 1b	ProfS-Clima	3,5 mois	Annuel	Français	1998
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Titre du cours : *Climatologie (module de spécialisation de Classe 1)*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

ANALYSE STATISTIQUE de données appliquées à la météorologie (cours et travaux dirigés : 50 heures) : Compression de l'informatique par analyse en composantes principales; Prévision des variables par analyse de régression; Prévision de phénomènes météorologiques par analyse discriminante; Définition des zones climatiques homogènes et des types de temps par classification automatique; Application combinée des méthodes d'analyse des données à l'adaptation statistique des prévisions numériques fournies par un modèle dynamique. **SYSTÈME DE GESTION DE BASE DE DONNÉES** (cours et travaux dirigés : 25 heures) : Présentation et utilisation d'ORACLE dans l'archivage des données climatologiques; Réalisation d'un **PROJET** climatologie sur ordinateur (150 heures) : Selon les possibilités d'organisation, le sujet de ce projet peut être choisi en fonction de l'intérêt de l'élève, et opérer sur des données provenant de son pays d'origine. Le candidat intéressé par une telle orientation du projet doit le faire savoir lors de l'envoi de son dossier d'inscription, en étant le plus précis possible sur le thème, la méthodologie, la nature des données qui seront apportés, etc.; après l'inscription, un contact du responsable pédagogique du module pourra être pris avec le candidat pour faire le point des possibilités réelles de suite. **EVOLUTION DU CLIMAT** (conférences) : Paléoclimatologie, modélisation du climat, fluctuations naturelles et modifications du climat (effet de serre, trou d'ozone, etc.). **AGROMÉTÉOROLOGIE** (cours : 50 heures) : Bilan d'énergie au sol; Phénologie et sommes de température; Gelées; Evapotranspiration; Calcul du bilan hydrique (présentation d'un logiciel d'Enseignement Assisté par Ordinateur intitulé BILHY); Logiciels d'agrométéorologie d'EUCLIDE; Phytopathologie; Jours disponibles; Différents types d'information et diffusion; Connaissance du monde agricole; Axes actuels de développement de l'agrométéorologie (télédétection). **COMPLÉMENTS** : Selon possibilité d'organisation, des activités complémentaires pourront être proposées, sur des sujets particuliers de climatologie ou d'hydrologie, par exemple en support à la réalisation du projet.

Examen de dossier (demander formulaire à l'ENM); date limite - fin juin. Coût : 16 000 FF; logement et restauration possibles sur le site de l'ENM, Toulouse.

Admiss.: Bonne connaissance climatologique et statistiques de l'enseignement fondamental de Classe I, et du FORTRAN.

FRA-1-12 Mots-clé: MET Technicien Cl.2 Proff-Ingén 2,5 mois Annuel Français 1998

Titre du cours : *Techniques de l'ingénieur météorologiste (module de spécialisation de classe 1)*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

MÉTÉOROLOGIE APPLIQUÉE À LA PRÉVISION (30 heures) : Rappels de circulation générale; Les mouvements synoptiques et interactions; Interprétation des champs de modèles; Mise en évidence des masses d'air (aérologie). STATISTIQUES (40 heures) : Notion de probabilités; Descriptions graphiques et numériques des échantillons; Etudes des échantillons; Test du Khi-Deux; La contingence et la corrélation linéaire simple; Utilisation d'un logiciel implanté sur microordinateur type PC. INFORMATIQUE (50 heures) : Rappels d'informatique générale; Programmation - Algorithmique - Apprentissage de PASCAL; Systèmes d'exploitation MS/DOS; Télécommunications, réseaux, bases de données. ANGLAIS (50 heures) : Anglais général, oral et écrit; Anglais scientifique et météorologique. RELATIONS HUMAINES ET COMMUNICATION (25 heures) : Communication orale et écrite, Conduite de réunion. GESTION DE PROJET (25 heures) : Articulation physique et temporelle d'un projet; Méthodes et moyens de gestion. FONCTIONNEMENT D'UN SERVICE MÉTÉOROLOGIQUE NATIONAL (15 heures) : Présentation des services et activités de Météo-France.

Examen de dossier (demander formulaire à l'ENM); date limite - fin juin. Coût : 10 000 FF; logement et restauration possibles sur le site de l'ENM, Toulouse

Admiss.: Bonnes connaissances en météorologie générale.

FRA-1-13 Mots-clé: MET Clhymet Cl.2 ProfS-Agric 2 semaines Annuel Français 1998

Titre du cours : *Agrométéorologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Bilan d'énergie au sol; Phénologie et sommes de températures; Gelées; Evapotranspiration; Calcul du bilan hydrique - présentation d'un logiciel d'enseignement assisté par ordinateur (EAO) intitulé BILHY; Logiciels d'agrométéorologie d'EUCLIDE; Phytopathologie; Jours disponibles; Différents types d'information et diffusion; Connaissance du monde agricole.

OBJECTIFS : Acquérir les bases théoriques et éléments pratiques nécessaires à l'assistance météorologique opérationnelle pour l'agriculture. Tarif : 7 300 FF.

Admiss.: Bonnes connaissances en météorologie et climatologie

FRA-1-14 Mots-clé: MET Scientifique Cl.1b ProfS-Spéci 2 semaines Annuel Français 1998

Titre du cours : *Analyse numérique*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Introduction générale : historique, domaine couvert par l'analyse numérique, classification des équations aux dérivés partielles; Présentation de la démarche d'analyse numérique sur un exemple - différences finies; Résolution des systèmes linéaires - méthodes directes, itératives, de descente; Compléments sur les problèmes elliptiques non linéaires - méthode de décomposition; Introduction à la technique des éléments finis - exemple mécanique, minimisation et principe variationnel, méthode de Galerkin; Equation d'évolution; Equations hyperboliques; Equations différentielles ordinaires; Compléments sur les équations non linéaires météorologiques - schéma semi-implicite, quasi-lagrangien, instabilité non linéaire; Méthode spectrale pour des problèmes linéaires et non linéaires - principe, technique de Galerkin et de collocation, problème de l'aliasing.

OBJECTIFS : Acquérir les outils de l'analyse numérique utilisés en modélisation numérique des équations de la météorologie ou de l'océanographie. Tarif : 9 800 FF.

Admiss.: Bonnes notions en algèbre linéaire et calcul matriciel, série et transformation de Fourier.
Programmation en langage FORTRAN

FRA-1-15 Mots-clé: MET InstrumEquip Cl.2-3 ProfS-Instr 4 jours Annuel Français 1998

Titre du cours : *Capteurs de base*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

RAPPEL DE MÉTÉOROLOGIE. VENT: Principe de fonctionnement du capteur DEOLIA-92; Architecture

de diffusion de l'information vent; Travaux pratiques - installation d'une chaîne de mesures complète, identification de pannes. **HYGROMÉTRIE** : Principe de fonctionnement de l'hygromètre HMP35DE; Gestion du parc d'hygromètre (procédures associées); Travaux pratiques - étalonnage. **BAROMÉTRIE** : Principe de fonctionnement des baromètres du réseau (LEEM, AIR, PA11, PTB210); Gestion du parc de baromètres (procédures associées); Travaux pratiques - étalonnage. **PLUVIOMÉTRIE** : Principe de fonctionnement des pluviomètres du réseau (PRECIS-MECANIQUE, SOCRIMA, VALCAP); Travaux pratiques - ajustage et contrôle.

OBJECTIFS : Acquérir les modalités d'installation, d'utilisation, de maintenance de capteurs mesurant les paramètres météorologiques usuels : vent, température, humidité, pression, précipitation. Tarif : 3 000 FF.

Admiss. : Posséder les notions de base sur la mesure physique électronique. Il est souhaitable de consulter avant la stage les notices techniques et d'utilisation des capteurs étudiés.

FRA-1-16 Mots-clé: MET InstrumEquip Cl.2-3 ProfS-Instr 4 jours Annuel Français 1998

Titre du cours : *Capteurs aéronautiques*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

HAUTEUR DE LA BASE DES NUAGES : Principe de fonctionnement du télémètre réseau LD-WHX05; Consigne d'installation, test de lignes; Travaux pratiques - installation complète, identification de pannes. **VISIBILITÉ** : Principe de fonctionnement du transmissomètre DIII et du luminancemètre intégré; Consignes d'installation; Travaux pratiques - installation complète, identification de pannes, information sur les visibilimètres.

OBJECTIFS : Sensibiliser les stagiaires aux mesures météorologiques destinées à l'aéronautique, permettre une analyse fonctionnelle des capteurs utilisés et des équipements associés. Tarif : 3 200 FF.

Admiss. : Niveau de formation des techniciens supérieurs d'installation de Météo-France.

FRA-1-18 Mots-clé: MET Scientifique Cl.1b ProfS-Prfct 2 semaines Annuel Français 1998

Titre du cours : *Ecole d'été de statistiques*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Compression de l'information par analyse en composantes principales; Prévisions des variables par analyse de régression; Prévision des phénomènes météorologiques par analyse discriminante; Définition des zones climatiques homogènes et des types de temps par classification automatique; Application combinée des méthodes d'analyse des données à l'adaptation statistique des prévisions numériques fournies par un modèle dynamique.

OBJECTIFS : Acquérir les éléments théoriques et les méthodes d'analyse multidimensionnelle appliquées à la météorologie dans un but prévisionnel. Cela concerne la prévision des variables, vecteurs et champs météorologiques, aussi bien que de l'occurrence des phénomènes météorologiques. Tarif : 9 800 FF.

Admiss. : Connaissances générales : en probabilités et en statistiques (Réf: Calcul des probabilités et statistiques J. VIALAR tomes I et II); en algèbre linéaire et calcul matriciel; en programmation FORTRAN.

FRA-1-20 Mots-clé: MET Opérationnel Cl.2 ProfS-SateM 3 semaines Annuel Français 1998

Titre du cours : *Interprétation de l'imagerie satellitale*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Généralités sur les satellites; Radiométrie et capteurs satellitaires; Télémessures opérationnelles, télécomm.; Analyse de l'imagerie - moyennes latitudes, régions tropicales et intertropicales, phénomènes particuliers; Applications en météorologie - analyse et prévision du temps, suivi des cyclones, restitution opérationnelle de la température de la mer; Applications en océanographie; Télédétection et surveillance climatique; Traitement des données numériques; Travaux pratiques - interprétation de l'imagerie.

OBJECTIFS : Acquérir les techniques d'utilisation de l'imagerie satellitale météorologique. Tarif : 12 000 FF.

Admiss. : De bonnes connaissances en météorologie générale sont nécessaires.

FRA-1-22 Mots-clé: MET InstrumEquip Cl.2-3 ProfS-Instr 5 jours Annuel Français 1998

Titre du cours : *La mesure de la pression atmosphérique*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Notions générales de météorologie; Notions de statistiques appliquées; Présentation des différents types de

capteurs; Présentation générale des différentes méthodes d'étalonnage et du matériel associé; Gestion d'un parc de baromètres; Technique d'étalonnage des baromètres à mercure; Technique d'étalonnage des baromètres numériques (en laboratoire, sur site); Travaux pratiques d'étalonnage.

OBJECTIFS : Apporter des connaissances théoriques et pratiques dans les domaines de la mesure de la pression atmosphérique en laboratoire et en réseau, de l'étalonnage des baromètres, de la gestion d'un parc de baromètres. Tarif : 3 600 FF.

Admiss.: Bonnes connaissances en électronique.

FRA-1-23 Mots-clé: MET Instrum Equip Cl.2-3 ProfS-Instr 5 jours Annuel Français 1998

Titre du cours : *La mesure de la température et de l'humidité de l'air*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Notions générales de météorologie; Notions de statistiques appliquées; Définitions relatives à la mesure de température et à la mesure de l'humidité de l'air; Présentation générale des différents types de capteurs utilisés en mesures météorologiques - technologie, installation, maintenance; Gestion d'un parc d'hygromètres; Présentation générale des différentes méthodes d'étalonnage et du matériel associé; Travaux pratiques d'étalonnage.

OBJECTIFS : Apporter des connaissances théoriques et pratiques dans les domaines de la mesure de la température et de l'humidité de l'air, de l'étalonnage des capteurs, de la gestion d'un parc d'hygromètres. Tarif : 3 600 FF.

Admiss.: Bonnes connaissances en électronique.

FRA-1-24 Mots-clé: MET Opérationnel Cl.2 ProfS-Aeron 2 semaines Annuel Français 1998

Titre du cours : *Météorologie aéronautique*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Organisation mondiale et française de l'assistance aéronautique; Organisation de l'espace aérien, réglementation et contrôle; Les phénomènes météorologiques d'échelles synoptique et sous-synoptique; Les outils nécessaires à la prévision aéronautique - données observées, données satellitales, sorties de modèles, etc.; Etude et prévision des phénomènes météorologiques influant sur la sécurité des vols - turbulences cisaillement de vent, orage, givrage, visibilité; Travaux pratiques d'application - rédaction de TAF et élaboration de TEMSI; Notions de mécanique de vol.

OBJECTIFS : Acquérir les connaissances théoriques et pratiques nécessaires à l'assistance aéronautique adaptée à l'aviation commerciale. Tarif : 8 000 FF.

Admiss.: De bonnes connaissances en météorologie générale et en techniques de prévision sont nécessaires.

FRA-1-25 Mots-clé: MET Opérationnel Cl.2 ProfS-Marin 2 semaines Annuel Français 1998

Titre du cours : *Météorologie marine*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

LE MILIEU MARIN. INTERACTIONS AVEC L'ATMOSPHERE: Océanographie générale - géographie, courants marins, paramètres de l'eau; Interface air-mer - les échanges dynamiques et thermiques et leurs applications; Thermocline, houles, vagues, etc.; Océan et climat; Mesures à l'interface - mesures actuelles et perspectives. LA PRÉVISION MARINE : Les produits numériques utilisés; Méthodes d'estimation du vent synoptique en mer; La prévision de l'état de la mer - état actuel et perspectives; La prévision en bassin fermé - Méditerranée; Les effets côtiers; Les cyclones. L'ASSISTANCE MARINE : La climatologie marine - données, utilisation en assistance; L'assistance pour différents secteurs - pêche, marine marchande, plaisance, travaux maritimes à la côte et au large, etc.; L'organisation de la météorologie marine en France; Les activités du SCEM et des stations côtières; La diffusion de l'information météorologique; Conférence et débats - le point de vue d'un utilisateur.

OBJECTIFS : Acquérir les connaissances théoriques et pratiques nécessaires à l'assistance marine adaptée aux différents usagers. Tarif : 7 300 FF.

Admiss.: Bonnes connaissance de la météorologie générale (vents géostrophiques et du gradient) et de la prévision (conception et utilisation des modèles numériques).

FRA-1-26 Mots-clé: MET Opérationnel Cl.1b ProfS-Spéci 12 jours Annuel Français 1998

Titre du cours : *Météorologie tropicale (niveau avancé)*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Bilan énergétique et étude des phénomènes physiques : rayonnement, interactions océan-atmosphère, convection profonde. Circulation générale : circulation moyenne, asymétries, anomalies, téléconnexions. Perturbations tropicales : perturbations mobiles, cyclones, méthodes de prévision statistique. Travaux pratiques : études des situations sélectionnées, Méthode Dvorak

OBJECTIFS : Acquérir les éléments théoriques et pratiques nécessaires à la prévision opérationnelle et aux actions d'études et de développement dans les régions de basses et moyennes latitudes. Tarif : 11 000 FF.

Admiss.: Il est indispensable de posséder de bonnes connaissances en météorologie générale et dynamique.

FRA-1-27 Mots-clé: MET Opérationnel Cl.2-3 ProfS-Spéci 2 semaines Annuel Français 1998

Titre du cours : *Météorologie tropicale (niveau de base)*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Echelles spatio-temporelles; Introduction au bilan énergétique - flux méridiens; Schémas de circulation générale; Equateur météorologique; Perturbations tropicales; Travaux pratiques : utilisation des données rares et clairsemées, analyse chronologique, étude de situation; utilisation des imageries satellitaires.

OBJECTIFS : Acquérir les éléments théoriques et pratiques de la météorologie opérationnelle des régions de basses et moyennes latitudes. Tarif : 7 000 FF.

Admiss.: Il est indispensable de posséder les connaissances de météorologie générale.

FRA-1-30 Mots-clé: MET Technicien Cl.2-3 ProfF-DataP 2 semaines Annuel Français 1998

Titre du cours : *Statistiques de base*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Probabilités; Paramètres descriptifs d'une population; Etude des échantillons; Contingence et corrélation; Statistiques des valeurs extrêmes/durée de retour. Chacun de ces points sera illustré par des travaux pratiques d'application dans le domaine climatologique. Ce stage sera complété par une présentation d'EUCLIDE.

OBJECTIFS : Acquérir les notions de base en statistiques en vue de faciliter l'interprétation des séries de données météorologiques et de mener des études simples en climatologie. Tarif : 6 800 FF.

Admiss.: Mathématiques niveau baccalauréat scientifique

FRA-1-33 Mots-clé: MET PredictForec Cl.2 ProfS-Bases 2 semaines Annuelle Français 1998

Titre du cours : *Prévision météorologique; niveau de base*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Rappels de météorologie générale et dynamique - théories actuelles sur les perturbations aux latitudes tempérées; Structure des systèmes précipitants - systèmes frontaux et systèmes de méso-échelle, influences orographiques; Les modèles numériques - principes et mise en oeuvre, adaptation statistique des sorties de modèles; Contrôle Symposium; Données satellite pour la prévision, données radar pour la prévision et mesure des lames d'eau; Diagnostics synoptiques, météorologiques et prévision synoptique appliquée dans les latitudes moyennes; Anasyg, Presyg: définition, exemples, méthodologie.

Lieu du stage : Toulouse; Frais d'inscription : 8300 FF; Possibilités de logement et de restauration sur place.

Admiss.: Connaissances de base en météorologie générale et en météorologie dynamique.

FRA-1-34 Mots-clé: MET InstrumEquip Cl.2 ProfS-Instr 4 jours Annuelle Français 1998

Titre du cours : *Représentativité des mesures*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Rappel des facteurs influant sur la qualité d'une mesure; Rappel des règles de dégagement des capteurs, exemples d'erreurs liées à des obstacles proches; description de la classification d'un site pour le vent, la température, la pluie, le rayonnement; méthode de relevé des masques, avec visite de site et TP; détermination de la classe de divers sites; État du réseau RADOME.

Lieu du stage : Trappes; Frais d'inscription : 4200 FF.

Admiss.: Connaissances de base sur les différents paramètres météorologiques mesurés.

FRA-2 Université Paul Sabatier, Toulouse

Adresse : Université Paul Sabatier
DEA "Océan, Atmosphère, Biosphère"
O.M.P.; 14, Av. E. Belin
31 400 TOULOUSE, France

tél: (33) 61 33 27 67
fax: (33) 6133-2790
e-mail/tlx: ()

FRA-2-1 Mots-clé: MET Clhymet Cl. 1c UnivE-IDisc 6 mois Annuel Français 1995

Titre du cours : *DEA Océan, Atmosphère, Biosphère*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

TRONC COMMUN : Rayonnement et transfert radiatif (20 h); Processus dynamiques aux interfaces océan-atmosphère et sol-atmosphère (20 h); Cycles biogéochimiques (15 h); Introduction au traitement du signal et des images (20 h); Dynamique de l'atmosphère et de l'océan (15 h); Dynamique de la biosphère (10 h); Couplages du système climatique (10 h). OPTION "Dynamique de l'océan et de l'atmosphère" : Météorologie dynamique (20 h); Océanographie dynamique (20 h); Couplage océan-atmosphère en région tropicale (10 h); Nuages et électricité (25 h). OPTION "Géochimie de l'océan, de l'atmosphère, de l'atmosphère et de la biosphère" : Thermodynamique chimique (15 h), Traceurs géochimiques (15 h);

Cinétique géochimique (15 h); Composition de l'atmosphère et climat (15h); Couplage des processus dynamiques et géochimiques (10h). OPTION "Physique de la biosphère" : Processus de la biosphère continentale (20 h); Physique et interprétation des mesures (15 h); Modélisation des propriétés optiques (10 h); Traitement d'images (10 h); Modélisation de la biosphère (20 h). OPTION "Sciences et techniques spatiales" : Orbitographie (15 h); Introduction aux systèmes spatiaux (18 h); Environnement spatial (10 h); Mouvement et contrôle d'altitude (9 h); Contrôle et restitution d'orbite (18 h).

Formation sous la responsabilité conjointe de l'Université de Toulouse III et de l'Ecole nationale de météorologie de Toulouse (Météo-France). Admission sur dossier en juillet. Durée des cours : 1 an (octobre - juillet) en incluant 3 mois de stage en laboratoire. Possibilité de préparer ensuite une thèse de doctorat dans l'un des laboratoires d'accueil. Frais d'inscription: ceux de l'Université de Toulouse III.

Admiss.: Maîtrise, ingénieur ou diplôme équivalent.

FRA-3 Université Claude Bernard, Lyon I

Adresse : Université Claude Bernard , LYON I
Centre de météorologie et climatologie
43, Boulevard du 11 novembre
69 622 VILLEURBANNE, France

tél: (33) 7244-8000
fax: ()
e-mail/tlx: ()

FRA-3-1 Mots-clé: MET Scientifique Cl. 1a UnivE-Super 6 mois Annuel Français 1995

Titre du cours : *Météorologie et Climatologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

1. MÉTÉOROLOGIE (M. Chassaquaux) : L'atmosphère; Les échelles en météorologie; Pression et vents; Masses d'air (analyses de radiosondages); Fronts et perturbations.
2. CLIMATOLOGIE (M. Blanchet) : Facteurs du climat; Température, humidité, précipitations - analyse de ces paramètres et de leur répartition sur le globe; Les climats du globe, les climats de la France; Paléoclimatologie, évolution future du climat (les problèmes de l'ozone, de l'effet de serre, des pollutions). Travaux dirigés : analyse de cartes météorologiques, élaboration de cartes climatiques, etc.

L'enseignement dispensé à l'Université Lyon I a un caractère de "culture générale" destiné aux étudiants des divers parcours scientifiques de l'Université (physiciens, naturalistes, etc.). Il débouche sur une "Attestation d'études universitaires" qui constitue un "plus" dans un C.V.

Admiss.: Baccalauréat (toutes séries).

FRA-4 Faculté des sciences Gabriel, Dijon

Adresse : Faculté des sciences GABRIEL
Centre de recherches de climatologie
B.P. 138
21 004 DIJON, France

tél: (33) 8039-5743
fax: (33) 8039-5741
e-mail/tlx: fontaine@satie.u-bourgogne.fr

FRA-4-1 Mots-clé: MET Scientifique Cl. 1c UnivE-Super 6 semaines Annuel Français 1995

Titre du cours : *Option "systèmes climatiques" d'un DEA cohabilité , Interface océan/atmosphère et téléconnexions;*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

SYSTÈMES CLIMATIQUES : Interface océan/atmosphère et téléconnexion (15 h); Variabilité climatique (15 h); Topoclimatologie (15 h); Climatologie tropicale (15 h); Analyse des données (20 h); Informatique : développement d'applications (SAS-MATLAB-GRADS) sous UNIX (20 h).

Ce cours est un des modules du DEA "Interface nature-sociétés: systèmes climatiques, milieux, territoires". Cohabitation Universités de Chambéry-Dijon-Lyon 2-Lyon 3 et Saint Etienne. Responsable : Madame Brigitte Prost (Lyon 3). Seule l'option systèmes climatiques est mentionnée ci-dessus ainsi que les cours méthodologiques dispensés à Dijon.

Admiss.: Etre titulaire d'une maîtrise ou équivalent BAC + 4.

FRA-5 Université Blaise Pascal, Aubière

Adresse : Université Blaise Pascal - LAMP
24, av des Landais
63 177 AUBIERE, France

tél: (33) 7340-7351

fax: (33) 7327-1657

e-mail/tlx: flossman@opgc.univ-bpclermont.fr

FRA-5-1 Mots-clé: ENV Clhymet Cl. 1a UnivE-Super 50 heures Semest Français 1995

Titre du cours : *Physique et chimie de l'atmosphère*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Ce module comporte 40 heures de cours, 10 heures de travaux dirigés et 10 heures de travaux pratiques. Description de l'atmosphère terrestre (circulation générale, cellules de Hadley, phénomène El Niño); Effet de serre : équilibre radiatif, paléoclimatologie; Gaz carbonique et cycle du carbone; Ozone : capacité oxydante de la troposphère, chimie de la stratosphère, trou d'ozone.

Ce module est un des modules de préprofessionalisation du S4 (2 semestres de 2 années) des DEUG SSM (Sciences des structures et de la matière) et SNV (Sciences de la nature de la vie) auquel prépare l'U.F.R Sciences exactes et naturelles. Il est ouvert aux étudiants des options Physique, Sciences Physiques, Mathématiques, Chimie, Géophysique, Géologie, Sciences Naturelles, Biologie, etc. de ces DEUG. Il se veut une triple finalité: (1) Donner à tous les étudiants qui le préparent une culture générale en météorologie et sciences physiques et chimiques de l'atmosphère, c'est-à-dire une culture générale sur la cause et les lois des phénomènes que tout un chacun rencontre dans son environnement quotidien, ainsi qu'une culture générale sur les moyens de détecter ces phénomènes, de les prévoir, voire de les modifier; (2) Donner aux étudiants, qui se destinent à une profession dans laquelle la météorologie intervient, une chance supplémentaire au moment de la recherche d'un emploi; (3) Fournir les premières bases aux étudiants qui se destinent aux carrières de la météorologie et des sciences de l'atmosphère.

Admiss.: Etre en DEUG (1ère année).

FRA-5-2 Mots-clé: MET Clhymet Cl. 1a UnivE-Super 60 heures Annuel Français 1995

Titre du cours : *Cycle d'eau et flux d'énergie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Ce module comporte 40 heures de cours, 10 heures de travaux dirigés et 10 heures de travaux pratiques. Description du système "atmosphère - océan"; Observations météorologiques : moyens d'observation et données climatologiques; Principes physiques de base (équilibre hydrostatique, force de Coriolis, vent géostrophique, processus thermodynamiques); Flux d'énergie, cycle d'eaux : énergie solaire, bilan d'énergie au sol, flux de chaleur et d'humidité, etc.; Formation des nuages et précipitations; Perturbations synoptiques.

Voir les renseignements complémentaires sur le cours FRA-5-1.

Admiss.: Etre en DEUG 2ème année.

FRA-5-3 Mots-clé: MET Clhymet Cl. 1a UnivS-PhysM 3 trimestres Annuel Français 1995

Titre du cours : *Option "Processus physiques du climat" dans la cadre du DEA "Climat et physico-chimie de l'atmosphère"*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

A) TRONC COMMUN: Fonctionnement du système climatique (44 h); Bilan énergétique du système terre-

atmosphère (20 h); Aérosols atmosphériques - Physique et chimie des nuages (35 h); Cycles biogéochimiques : soufre, azote, halogènes, carbone et métaux lourds (25 h); Etude de l'atmosphère : méthodes chimiques et physiques (15 h).

B) OPTION : PROCESSUS PHYSIQUES DU CLIMAT: Processus radiatifs dans l'atmosphère et à la surface terrestre (20 h); Modélisation des nuages et des systèmes nuageux (30 h); Méthodes et techniques d'observation des nuages (15 h); Atelier : "Analyse de données et d'images" (30 h).

C) STAGE DE RECHERCHE EN LABORATOIRE: En complément des cours théoriques, les étudiants doivent effectuer un stage dans l'un des laboratoires d'accueil de la formation. Ces laboratoires sont situés à Grenoble, à Clermont-Ferrand, ainsi que dans diverses autres villes françaises ou étrangères. L'attribution des stages en laboratoire se fait dès septembre, après entrevue obligatoire (sauf cas particuliers) de l'étudiant avec le chercheur proposant le stage. Le stage s'étend normalement sur l'ensemble de l'année. Des aménagements sont cependant prévus pour les étudiants pour lesquels il serait impossible de réaliser le stage en parallèle avec les cours théoriques, pour des raisons d'éloignement géographique.

Ce DEA est organisé sous la responsabilité de l'Université Joseph Fourier de Grenoble, en association avec l'Université Blaise Pascal de Clermont-Ferrand. La formation s'adresse aux étudiants titulaires d'une maîtrise de sciences (notamment maîtrise ou magistère de physique, physique et applications, chimie physique ou chimie) ou d'un diplôme équivalent.

Admiss.: Sur dossier.

FRA-6 Ecole nationale du génie rural, des eaux et des forêts,
Montpellier

tél: (33) 6754-8754

Adresse : ENGREF, Centre de Montpellier

648, rue Jean-François Breton

Domaine de Lavalette 5093;

34 033 MONTPELLIER Cedex 1, France

fax: (33) 6704-7101

e-mail/tlx: ()

FRA-6-1 Mots-clé: HYD Technicien Cl. 1b ProfS-Eau 1 mois Annuel Français 1995

Titre du cours : *Hydrologie et eaux de surface*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

CLIMATOLOGIE GÉNÉRALE : Les méthodes de recueil des données hydroclimatologiques (capteurs, enregistreurs, banques de données); Les méthodes de critique, d'analyse et de régionalisation des données (analyse des composantes principales, analyse des résidus de régression, fonctions splines, krigeage); Le cycle l'eau, avec la formation des écoulements et les formules de calcul des apports.

HYDRAULIQUE À SURFACE LIBRE : Etude théorique des courbes de remous, caractéristiques des écoulements permanents et transitoires; Modélisation numérique; Utilisation d'un modèle réduit en laboratoire, visite de rivière; Transport solide et dynamique fluviale. Cet enseignement est ensuite appliqué pour la réalisation d'un projet de caractérisation hydrologique d'un bassin versant méditerranéen, en collaboration avec les différents partenaires concernés.

Nombre indicatif d'heures : de cours 60 heures; de travaux pratiques 24 heures; de travaux dirigés (projet) 30 heures; visites sur le terrain 6 heures; total 120 heures. Inscriptions au moins 2 mois avant le début du module. Frais de scolarité : 10 000 FF.

Admiss.: Niveau ingénieur ou équivalent.

FRA-7 Laboratoire d'hydrologie ORSTOM Montpellier

Adresse : Laboratoire d'hydrologie ORSTOM

911 Ave. Agropolis

34032 MONTPELLIER Cédex 1

France

tél: (33) 6761-7400

fax: (33) 6754-7800

e-mail/tlx: ORST MPL 485 507F

FRA-7-1 Mots-clé: HYD Opérationnel Cl. 1a-2 ProfF-Bases 8 semaines Annuel Français 1995

Titre du cours : *Formation complémentaire en Hydrologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

LE STAGE 1996 comporte sept modules traitant chacun un thème particulier de l'hydrologie. (La formation se déroule au laboratoire d'hydrologie du Centre ORSTOM de Montpellier et bénéficie de ses équipements : pédagogiques - matériels audio-visuels; informatiques - salle de formation équipée de micro-ordinateurs fonctionnant en réseaux; techniques - stations de réception (ARGOS-METEOSAT) des données par satellite, mini-simulateur de pluie, embarcation ZODIAC pour les jaugeage en rivières). MODULE 1 : Appareillages

et techniques de mesures - aspects théoriques; Centrales électroniques d'acquisition des données; Télétransmission des données; Stations hydrométriques; Mesurage des débits; Topographie. MODULE 2 : Appareillage et techniques de mesures - pratique de terrain. MODULE 3 : Tracé de la courbe de tarage. MODULE 4 : Gestion de banques de données (HYDROM et PLUVIOM). MODULE 5 : Etudes de cas - applications pratique des thèmes traités dans les modules précédents. MODULE 6 : Hydrologie de bassin versant expérimental; Initiation à la critique des données. MODULE 7 : Voyage d'étude.

Le laboratoire d'hydrologie de l'ORSTOM organise depuis plusieurs années des stages de formation complémentaire en hydrologie opérationnelle pour des ingénieurs et techniciens supérieurs praticiens de l'eau. Ces stages étaient axés principalement sur les nouvelles technologies et le traitement informatique des données. Nous avons procédé à un recentrage sur les bases de l'hydrométrie : mesurage des débits; critères d'installation de stations hydrométriques; tracé des courbes de tarage univoques, non univoques, extrapolations; topographie, etc., tout en maintenant, mais de manière un peu moins détaillée, les enseignements précédents. Cette évolution du programme nous semble correspondre aux besoins essentiels des Services nationaux et répond à une demande soutenue de nos partenaires. Le laboratoire participe aux enseignements universitaires - DEUST-DEA. Laboratoire d'accueil du DEA national d'hydrologie, des mémoires de DEA et de thèses y sont préparés par des étudiants français et étrangers.

Admiss.: Ingénieurs et techniciens supérieurs des Services hydrologiques

MDG-1 Ecole Supérieure Polytechnique - Département Météorologie

Adresse : Ecole Supérieure Polytechnique, d'Antananarivo (ESPA)
Département Météorologie
B.P. 562 et 1500
ANTANANARIVO 101, Madagascar.
CC: Direction de la Météorologie et de l'Hydrologie

pél: (261 20) 22 27696

fax: (261 20) 22 27696

e-mail/bx: 240.01-242.40

MDG-1-1 Mots-clé: MET Opérationnel Cl. 1a-2 UnivF-Bases 5 ans Triennal Français 1998

Titre du cours : *Formation d'ingénieurs de la météorologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

1ère Année: Tronc commun : Algèbre I et calcul numérique; Analyse I, calcul intégral et analyse vectorielle; Chimie générale I; Technicité I; Mécanique générale I; Optique; Thermodynamique; Physique; Circuits électriques et électroniques; Programmation.

2ème Année: Tronc commun : Analyse - Algèbre II; Géométrie analytique; Probabilité et statistique; Électricité II; Analyse fonctionnelle et calcul tensoriel; Circuits logiques; Dessin technique; Electronique; Informatique météorologie; Vibrations; Anglais; Français.

3ème Année : Observation; Climatologie; Instruments; Météorologie générale; Hydrologie I; Météorologie dynamique; Traitement des données météorologiques I; Cartographie; Mathématiques III; Mathématiques appliquées III; Mécaniques des fluides; Mécanique Quantique; Géographie; Macroéconomie; Anglais en météorologie; Voyage d'étude; Stages.

4ème Année: Météorologie; Dynamique II; Instruments II; Météorologie physique; Météorologie tropicale; Météorologie synoptique; Météorologie spatiale; Physique des nuages; Télécommunications météorologie; Hydrométrie; Hydrologie II; Traitement des données météorologiques et climatologiques II; Mathématique IV; Mathématiques appliquées IV; Programmation; Economie II; Gestion des projets I; Français; Mini-projet; Voyage d'étude; Stage.

5ème Année: Météorologie dynamique III; Météorologie tropicale II; Météorologie physique II; Météorologie agricole; Météorologie aéronautique; Météorologie maritime; Analyse et prévision météorologique; Hydrologie III; Question des connaissances stratégiques et management; Gestion des project II; Droit planification; Communication; Organisation et structure; Mémoire de fin d'études.

Les concours d'entrée en première année ont lieu en octobre et les inscriptions sont reçues à partir du mois de juillet. Les demandes d'admission en troisième année doivent parvenir à l'Ecole au mois de juillet au plus tard. Les étudiants sont logés au campus. Diplôme délivré: Ingénieur de la Météorologie.

Renseignements complémentaires: Représentant permanent de Madagascar auprès de l'OMM; Téléphone: (261 20) 22 402 41; Facsimile: (261 20) 22 30 44; Email: meteo@ds.mg; BP 1254, Antananarivo 101, Madagascar.

Admiss.: 1ère Année sur concours aux Bacheliers série Technique et Scientifique - 3ème année sur titres aux Titulaires Maîtrise Sciences; sur concours aux Titulaires Licence Sciences et Technician Supérieur.

MDG-1-2 Mots-clé: MET Technicien Cl. 2-3 Proff-Bases 2 ans Annuel Français 1998

Titre du cours : *Formation de Techniciens Supérieurs en Météorologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

1ère Année : Algèbre et calcul numérique; Analyse, calcul intégral et analyse vectorielle; Chimie générale; Electricité; Mécanique générale; Optique; Thermodynamique; Physique; Programmation; Observation, instruments.

2ème Année : Météorologie générale; Météorologie tropicale; Climatologie; Hydrologie; Cartographie; Météorologie synoptique; Météorologie aéronautique; Météorologie agricole; Météorologie maritime; Analyse et prévision en météorologie; Télécommunications; Informatique et traitements des données; Statistique; Anglais; Gestion administrative et financière; Complément d'observations et d'instruments; Stages.

Les demandes d'admission doivent parvenir à l'Ecole au mois de juillet au plus tard. Les étudiants sont logés au campus la première année. Diplôme délivré: DUET.

Admiss.: 1ère année sur examen dossier aux titulaires Baccalauréat série Technique et série Scientifique.

MDG-2 Ecole Nationale d'Enseignement de l'Aéronautique et de la Météorologie (ENEAM)						
Adresse : Ecole Nationale d'Enseignement de l'Aéronautique et de la Météorologie (ENEAM) BP 62 Ivato Aéroport 105 ANTANANARIVO, Madagascar			tél: (261 20) 22 44973 fax: (261 20) 22 44973 e-mail/tbc:			
MDG-2-1	Mots-clé: MET Opérationnel Cl. 2	ProfF-Bases	4 ans	Quadrien	Français	1998
Titre du cours : Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) : 1ère Année: Mathématiques; Probabilités et statistiques; Physique I; Météorologie générale; Climatologie; Observations et tenue de documents; Instruments; Météorologie physique I; Météorologie dynamique I; Cartographie; Météorologie tropicale; Hydrologie; Informatique I; Électronique. 2ème Année: Physique II; Météorologie physique II; Géographie; Météorologie synoptique; Hydrologie II; Météorologie dynamique II; Télécommunications; Anglais II; Droit administrative; Informatique II; Radio électronique. 3ème Année: Prévision synoptique; Prévision numérique; Météorologie aéronautique; Météorologie maritime; Météorologie agricole; Météorologie spatiale; Anglais III; Administration; Gestion d'entreprise. 4ème année: Météorologie spatiale II; Organisation des centres et services météorologiques; Stage pratique dans un centre météorologique; Préparation et soutenance de Mémoire. Possibilités d'hébergement dans la limite des places disponibles du dortoir (cout location 350 US\$ par an). Frais de scolarité 3600 US\$ par an. Renseignements complémentaires: Représentant permanent de Madagascar auprès de l'OMM; Téléphone: (261 20) 22 402 41; Facsimile: (261 20) 22 30 44; Email: meteo@mts.mg; BP 1254, Antananarivo 101, Madagascar. Admiss.: Sur titre après examen du dossier pour les titulaires du diplôme de Technicien Supérieur de la Météorologie.						
MDG-2-2	Mots-clé: MET Opérationnel Cl. 4	ProfF-Bases	8 mois	Annuel	Français	1998
Titre du cours : Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) : Physique; Météorologie générale; Climatologie; Instruments et méthodes d'observation; Tenue de documentation; Initiation à l'informatique; Stage pratique dans un centre météorologique. Possibilités d'hébergement dans la limite des places disponibles du dortoir (cout location 344 US\$). Frais de scolarité 2400 US\$. Admiss.: Sur concours pour titulaires du B EPPC						
MDG-2-3	Mots-clé: MET Opérationnel Cl. 2	ProfF-Bases	2 ans	Annuel	Français	1998
Titre du cours : Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) : 1ère Année: Mathématiques; Physiques; Anglais, générale et technique; Météorologie générale; Thermodynamique, de l'atmosphère; Météorologie dynamique; Météorologie synoptique; Informatique; Météorologie tropicale; Météorologie aéronautique. 2ème Année: Météorologie maritime; Météorologie spatiale; Météorologie agricole; Hydrologie; Instruments et observation météorologique; Climatologie; Cartographie; Prévision synoptique; Télécommunications; Radio électronique; Organisation des centres et services météorologiques; Stage pratique dans un centre météorologique Possibilités d'hébergement dans la limite des places disponibles du dortoir (cout location 350 US\$ par an). Frais de scolarité 3000 US\$ par an. Admiss.: Sur concours pour titulaires du Baccalauréat scientifique; Après examen du dossier pour les Météorologues de Classe IV justifiant ancienneté.						

MOROCCO, The Kingdom of

MAR-1	Centre de formation des techniciens de l'aéronautique civile et de la météorologie, Casablanca	TÉL:	(212-2) 200-067
Adresse :	Direction de la Météorologie Nationale B.P. 8106 Casa-Oasis, Aéroport Casa-Anfa, 20103, CASABLANCA, Maroc	FAX:	(212-2) 200 071
		E-M/tlx:	246.55 M

MAR-1-1	Mots-clé: MET Technicien	Cl. 3	ProfE-Bases	2 ans	Ad hoc	Français	1986
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Titre du cours : *Formation conduisant au grade d'adjoint technique spécialisé (ATS) - Classe III avancée*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Mathématiques; Physique et thermodynamique; Eléments de radio-électricité; Informatique; Anglais technique et général; Météorologie générale; Aérologie; Météorologie maritime; Météorologie aéronautique; Géographie et cosmographie; Codes météorologiques; Instruments et méthodes d'observation; Rayonnement et mesures connexes; Sondage vent; Nuages et physiques des nuages; Cartographie sol et altitude; Tenue de documents; Manipulation téléimprimeurs; Transmissions météorologiques; Eléments néphanalyse; Circulation aérienne; Administration et comptabilité; Arabe technique; Conférences, visites, projection de films, etc.

Etudiants africains francophones acceptés dans la limite de 25% des places disponibles.

Admiss.: Baccalauréat C et D type français.

NER-2 Ecole Africaine de la Météorologie et de l'Aviation
Civile, Niamey

tél: (227) 72.36.62

Adresse : Ecole Africaine de la Météorologie et de l'Aviation Civile
(EAMAC)
B.P. 746
NIAMEY Niger

fax: (227) 72.22.36

e-mail/tlx: dem@eamac.eamac.ne

NER-2-1 Mots-clé: MET Opérationnel Cl.1 ProfF-Bases 3 ans Annuel Français 1997

Titre du cours : *Formation Initiale des Ingénieurs de la Météorologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Enseignements Généraux: mathématiques, probabilités, statistique, physique, mécanique des fluides, informatique, Anglais général, analyse des données, analyse numérique et d'autres thèmes relevant de l'art de l'Ingénieur; Météorologie Fondamentale: rayonnement, météorologie physique, météorologie dynamique, météorologie synoptique, physique des nuages, couche limite, météorologie tropicale; Météorologie Appliquée: climatologie, prévision numérique, météorologie aéronautique, agrométéorologie, hydrométéorologie, biométéorologie, météorologie marine, océanographie; Acquisition et Traitement des Données: instruments, observations, cartographie, météorologie satellitale, CLICOM, prévisions météorologiques; Stages: stage d'immersion, stages pratiques EAMAC, stage ACMAD, stage en station et formation à l'étranger; Mémoire de fin d'étude.

Possibilités de logement et de restauration à la cité de l'Ecole. Début des cours: Début du mois d'octobre de chaque année.

Admiss.: DEUG Scientifique ou le DUES + Concours.

NER-2-2 Mots-clé: MET Opérationnel Cl.3 ProfF-Bases 2 ans Annuel Français 1997

Titre du cours : *Formation Initiale des Techniciens Supérieurs de la Météorologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

1-ère année: mathématiques, probabilités, statistique, physique, informatique, météorologie générale, climatologie, météorologie marine, agrométéorologie, hydrométéorologie, instruments météorologiques classiques, observations météorologiques en surface, codes météorologiques, cartographie, exploitation des télécommunications, Anglais général, géographie et quelques matières d'intérêt général; stages et conférences, stage d'immersion et visites.

2-ème année: météorologie générale, météorologie aéronautique, météorologie satellitale, CLICOM, Anglais technique; stages pratiques, Ateliers, Projet final.

Possibilités de logement et de restauration à la cité de l'Ecole. Début des cours: Début du mois d'octobre de chaque année.

Admiss.: Baccalauréat Scientifique ou Technique + Concours.

NER-2-3 Mots-clé: MET Prévision Cl.1-2 ProfF-Speci 7 semaines Annuel Français 1997

Titre du cours : *Stage Prévisions Météorologiques*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Aérologie; Observation et Veille Météorologique d'Aérodrome; Météorologie Satellitale; Météorologie Aéronautique; Ateliers de Prévisions; Travaux Pratiques.

Possibilités de logement et de restauration à la cité de l'Ecole. Début des cours: Fin mai de chaque année.

Admiss.: Etre Ingénieur de la Météorologie assurant les fonctions de prévisionniste.

NER-2-4 Mots-clé: MET Technicien Cl.3 ProfF-Speci 6 semaines Annuel Français 1997

Titre du cours : *Stage Météorologie Tropicale et Satellitale*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Météorologie Tropicale; Météorologie Satellitale; Synthèse: Travaux Pratiques.

Possibilités de logement et de restauration à la cité de l'Ecole. Début des cours: Fin janvier de chaque année.

Admiss.: Etre Technicien Supérieur de la Météorologie assurant les fonctions de protectionniste-veilleur.

NER-2-5 Mots-clé: MET Technicien Cl. 3 Proff-Speci 8 semaines Annuel Français 1997

Titre du cours : *Stage Protection et Veille Météorologique d'Aérodrome*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Aérologie; Observations et Veille Météorologique d'Aérodrome; Météorologie Satellitale; Assistance à la Navigation Aérienne; Phénomènes Dangereux; Cartographie; Circulation Aérienne.

Possibilités de logement et de restauration à la cité de l'Ecole. Début des cours: Fin janvier de chaque année.

Admiss.: Etre Technicien Supérieur ou Assistant de la Météorologie assurant les fonctions de protectionniste-veilleur.

NER-2-6 Mots-clé: MET Clhymet Cl. 3 Proff-Clima 6 semaines Annuel Français 1997

Titre du cours : *Climatologie de Base*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Informatique; Statistique et Climatologie; Travaux Pratiques de Statistique Climatologique; Climatologie; CLICOM; Atelier climatologie.

Possibilités de logement et de restauration à la cité de l'Ecole. Début des cours: mai et octobre de chaque année.

Admiss.: Etre Technicien Supérieur de la Météorologie assurant les fonctions de climatologie ou d'observateur.

NER-2-7 Mots-clé: MET Observation Cl. 3 Proff-Speci 6 semaines Annuel Français 1997

Titre du cours : *Chef Station d'Observation*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Nuages et Météores; Informatique; Ateliers observations; CLICOM; TCM; Message; Commendement Aérodrome; Rédaction de Rapports.

Possibilités de logement et de restauration à la cité de l'Ecole. Début des cours: Début du mois d'avril de chaque année.

Admiss.: Etre Technicien Supérieur de la Météorologie assurant les fonctions d'observateur ou de climatologie.

NER-2-8 Mots-clé: MET Observation Cl. 3 Proff-Aerol 6 semaines Annuel Français 1997

Titre du cours : *Mesure en altitude*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Rappel d'observations en surface; Sondage PO et PGV; Circulation Aérienne; Informatique; CLICOM; Radiosondage station STAR; Documents/Messages.

Possibilités de logement et de restauration à la cité de l'Ecole. Début des cours: Début du mois d'octobre de chaque année.

Admiss.: Etre Technicien Supérieur de la Météorologie assurant les observations en altitude.

RWANDA; The Rwandese Republic

RWA-1 Ecole nationale de l'aviation et de la météorologie

TÉL: (250) 758.13

Adresse : Direction de la Météorologie
Ministère des Transports et des Communications
B.P. 898 KIGALI, République Rwandaise

FAX: (250) 729.71

E-Mail: 226.99 AVIAMET RW

RWA-1-1 Mots-clé: MET Observation Cl. 4 ProfF-Bases 1 année Ad hoc Français 1988

Titre du cours : *Météorologie*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

La formation correspond au niveau classe IV de l'OMM, avec une légère adaptation conforme aux besoins du Rwanda. Nuages et météores; Codes météorologiques; Météorologie générale; Documents techniques; Instruments et méthodes d'observation; Météorologie aéronautique; Climatologie; Météorologie agricole et notions d'hydrologie; Cartographie; Météorologie tropicale; Sondage aérologique; Organisation météorologique mondiale et organismes internationaux en relation avec la météorologie; Télécommunications météorologiques; S.I.S. (Secourisme, Incendie, Sauvetage); S.I.A. (Service d'Information aéronautique). Travaux pratiques : Instruments météorologiques; Méthodes d'observation; Cartographie; Sondage.

Jusqu'à présent les étudiants étrangers n'ont pas fait la demande. Ils seraient certainement reçus à condition de disposer d'une bourse de leur gouvernement ou d'une autre institution. Frais (1988) : les étudiants reçoivent une allocation du gouvernement.

Admiss.: 6, 7 ans d'études secondaires.

SWITZERLAND; The Swiss Confederation

CHE--1	Université de Genève; Département de géographie	TÉL:	(41-22) 705-8349				
Adresse :	Département de géographie Université de Genève, Faculté des sciences 102 Bd. Carl-Vogt 1211 GENÈVE, Suisse	FAX:	(41-22) 761-4100				
		E-M/tlx:					
CHE--1--1	Mots-clé: MET Opérationnel Cl. 1a	UnivF-Clima	1 semestre	Annuel	Français	1995	
Titre du cours : <i>Climatologie</i> .							
Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :							
Climatologie générale : L'action du climat sur l'homme; Eléments et principe de climatologie générale; Les grandes divisions climatiques; Climats locaux; Eléments de météorologie - les outils d'observation et de prévision; L'action de l'homme sur le climat (pollution, "effet de serre", ozone).							
Admiss.: Immatriculation universitaire.							
CHE--1--2	Mots-clé: ENV Scientifique Cl. 1a	UnivE-Envir	1 semestre	Annuel	Français	1995	
Titre du cours : <i>Le climat et l'homme; climat et établissements humains</i>							
Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :							
Prof. Dr. Bertrand Levy, Département de géographie; 7, rte de Drize; 1227 Carouge, Genève; tél : (41-22) 789 20.49.							
Admiss.: Immatriculation universitaire.							
CHE--2	Institute fédéral de technologie, ETH, Zurich	TÉL:	(41-01) 633-2755				
Adresse :	Institut fédéral de technologie, ETH Département de physique de l'atmosphère 8093 ZURICH, Suisse	FAX:	(41-01) 633-1058				
		E-M/tlx:	waldvogel&atmos.umnw.ethz.ch				
CHE--2--1	Mots-clé: MET Scientifique Cl. 1a	UnivE-Bases	2 semestres	Annuel	German	1995	
Titre du cours : <i>Physique de l'atmosphère</i>							
Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :							
Physique de l'atmosphère I et II.							
Admiss.: Immatriculation universitaire.							
CHE--3	Université de Fribourg	TÉL:	(41-37) 29-9010				
Adresse :	Institut de géographie Faculté des sciences Université de Fribourg 1700 FRIBOURG, Suisse	FAX:	(41-37) 82-6598				
		E-M/tlx:					
CHE--3--1	Mots-clé: ENV Scientifique Cl. 1a	UnivE-ET&R	1 année	Annuel	Français	1995	
Titre du cours : <i>Introduction à la climatologie et à la météorologie</i> .							
Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :							
Eléments du climat et de la météorologie : Rayonnement, température et humidité de l'air, nébulosité, précipitations; Applications micro- et méso-climatologiques à la vie quotidienne des individus; Pression atmosphérique et vents à diverses échelles; Stabilité et instabilité atmosphérique; Structure de l'atmosphère; Circulation générale et forces qui la régissent; Circulation régionale et types de temps; Classification des climats.							
Admiss.: Maturité (Université).							
CHE--3--2	Mots-clé: MET Observation Cl. 1c	UnivF-Dynam	1 année	Annuel	Français	1995	
Titre du cours : <i>Météorologie régionale</i> .							

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :
Les théories de la circulation atmosphériques, conceptions récentes; Les principales lois de la circulation atmosphérique; Applications de ces lois à différentes échelles, interactions; Introduction à la recherche appliquée, échelles locales et régionales.
Admiss.: Maturité (Université).

CHE-3-3	Mots-clé: ENV Clhymet	Cl. 1c	UnivF-Pollu	1 année	Annuel	Français	1995
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Titre du cours : *Etudes d'impact sur l'environnement atmosphérique*
Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :
Problèmes posés par la législation; Méthodes d'analyse sectorielle des impacts; Descriptions des principaux mécanismes à l'origine de la pollution de l'air.
Admiss.: Maturité (Université).

TUNISIA, The Republic of

TUN-1	Ecole de l'Aviation Civile et de la Météorologie	TÉL:	(216-1) 784 608					
Adresse :	Institut national de la météorologie B.P. 156-2035 TUNIS-CARTHAGE CC: Ecole de l'aviation civile et de la météorologie 1142 BORDJ-EL AMRI, Tunisie	FAX:	(216-1) 784 608	E-Mtx:	141.95			
TUN-1-1	Mots-clé: MET AidePrévisio	Cl. 2	ProfE-Bases	4 ans	Annuel	Français	1988	
Titre du cours : <i>Ingénieur des travaux de l'Etat - Classe II</i>								
Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :								
ENSEIGNEMENT GÉNÉRAL : Organisation de la météorologie; Administration; Anglais; Géographie; Mathématiques; Physique; Cosmographie; Thermodynamique; Mécanique des fluides; Mécanique générale; Informatique.								
ENSEIGNEMENT PROFESSIONNEL : Météorologie physique et nuages; Météorologie synoptique; Exploitation météorologique ; Instruments; Météorologie marine; Météorologie aéronautique; Météorologie agricole; Climatologie; Hydrométéorologie; Météorologie dynamique; Rayonnement; Météorologie basse couche; Météorologie spatiale; Transmissions; Météorologie générale; Statistiques; Analyse numérique; Prévision numérique générale; Météorologie tropicale; Météorologie appliquée; pollution; Séismologie; Navigation aérienne; Radar; Conférences; Stages.								
Frais (1988) : 2000 Dinars par année tout cycle.								
Admiss.: Baccalauréat.								
TUN-1-2	Mots-clé: MET Technicien	Cl. 2-3	ProfE-Bases	2 ans	Annuel	Français	1988	
Titre du cours : <i>Technicien supérieur</i>								
Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :								
ENSEIGNEMENT GÉNÉRAL : Organisation de la météorologie; Administration; Anglais; Géographie; Mathématiques; Physique; Thermodynamique; Mécanique des fluides; Mécanique générale; Informatique; Cosmographie.								
ENSEIGNEMENT PROFESSIONNEL : Météorologie physique; Météorologie synoptique; Exploitation météorologique; Instruments; Météorologie aéronautique; Météorologie marine; Météorologie agricole; Climatologie; Transmissions; Météorologie dynamique; Météorologie tropicale; Hydrométéorologie; Météorologie appliquée; Météorologie satellite; Prévisions générale et numérique; Séismologie; Météorologie basse couche; Radar; Statistiques; Rayonnement; Pollution; Conférences; Stages; Navigation aérienne.								
Frais (1988) : 2000 Dinars par année tout cycle.								
Admiss.: Baccalauréat.								
TUN-1-3	Mots-clé: MET Technicien	Cl. 3	Proff-Bases	1 année	Annuel	Français	1988	
Titre du cours : <i>Adjoint technique, Classe III</i>								
Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :								
Organisation de la météorologie; Météorologie générale; Instruments météorologiques en surface; Instruments météorologiques en altitude; Cartographie; Observations et nuages; Transmissions (organisation et procédures); Climatologie générale et statistiques; Radar; Géographie; Assistance aéronautique; Agrométéorologie; Hydrométéorologie; Droit administratif; Traitement de l'informatique; Prévisions classique et numériques; Météorologie tropicale; Météorologie maritime; Météorologie spatiale; Navigation aérienne; Séismologie; Rayonnement; Pollution; Conférences; Stages.								
Frais (1988) : 2000 Dinars par année tout cycle.								
Admiss.: Baccalauréat.								

VIET NAM, The Socialist Republic of

VNM-1	Université de Hanoi; Ecole centrale de formation des météorologistes et hydrologistes à Son Tây	TÉL:	(84-4) 53 467
Adresse :	Service hydrométéorologique de la R.S. du Vietnam No. 4 rue Dang Thai Than HANOI, Vietnam	FAX:	(84-4) 260 779
		E-M/tlx:	HYDROMETEO Hanoi

VNM-1-1 Mots-clé: MET Opérationnel Cl. 1a-2 ProfF-Bases 3-5 ans Annuel Vietnamienn 1988

Titre du cours : *Cours de formation des météorologistes et hydrologistes des classes I et II*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Météorologie générale; Météorologie dynamique; Météorologie synoptique; Météorologie agricole; Météorologie aéronautique; Climatologie générale; Climat du Vietnam; Instruments météorologiques.

Renseignements complémentaires : Département de géographie et de géologie, Université de Hanoi; Ecole centrale de formation des météorologistes et hydrologistes à Son Tây; Ecole de formation de météorologiste et des hydrologistes à Hô Chi Minh Ville.

Admiss.: Certificat de l'école secondaire d'enseignement général (12 ans).

VNM-1-2 Mots-clé: MET Opérationnel Cl. 3 ProfF-Bases 2,5 ans Annuel Vietnamienn 1988

Titre du cours : *Cours de formation des météorologistes de la classe III*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Météorologie générale; Climatologie; Prévisions du temps; Climat du Vietnam; Météorologie agricole et observations agrométéorologiques; Météorologie aéronautique; Codes météorologiques; Observations météorologiques en surface; Instruments météorologiques.

Admiss.: Certificat de l'école secondaire d'enseignement général (12 ans).

VNM-1-3 Mots-clé: HYD Opérationnel Cl. 1a-2 ProfF-Bases 3-5 ans Annuel Vietnamienn 1988

Titre du cours : *Cours de formation des hydrologistes des classes I et II*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Hydrologie générale; Hydrodynamique; Prévisions hydrologiques, Calcul des courants; Hydrologie du Vietnam; Investigation et mesure hydrologiques; Hydrologie chimique.

Admiss.: Certificat de l'école secondaire d'enseignement général (12 ans).

VNM-1-4 Mots-clé: HYD Opérationnel Cl. 3 ProfF-Bases 2,5 ans Annuel Vietnamienn 1988

Titre du cours : *Cours de formation des hydrologistes de la classe III*

Programme du cours et enseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.) :

Hydrologie générale; Calcul des courants; Hydrodynamique; Prévisions hydrologiques; Hydrologie du Vietnam; Investigation et mesure hydrologiques.

Admiss.: Certificat de l'école secondaire d'enseignement général (12 ans).

ZAIRE, The Republic of

ZAR-1 Institut Supérieur des Techniques Appliquées, Kinshasa TÉL: (243-12) 80 005
 Adresse : Agence nationale de météorologie FAX:
 B.P. 4715, Kinshasa II
 CC: Institut Supérieur des Techniques Appliquées E-Mtx: METEOR Kinshasa
 (I.S.T.A.) B.P. 6593, KINSHASA-31, Zaïre

ZAR-1-1 Mots-clé: MoH AidePrévisio Cl. 2 UnivF-Bases 4 ans Annuel Français 1988

Titre du cours : *Cours de météorologie/agrométéorologie/hydrométéorologie - Diplôme d'études supérieures (classe II)*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.):

COURS GÉNÉRAUX : Mathématiques; Physique appliquée; Chimie appliquées; Cosmographie; Géographie physique; Géophysique; Éléments d'électricité et électronique; Anglais technique; Probabilités et statistiques; Mécanique des fluides; Physique de l'atmosphère; Informatique; Initiation à la recherche; Climatologie générale, Météorologie générale; Législation industrielle; Ethique et déontologie professionnelle; Gestion des entreprises et Economie politique. **PRÉVISION AÉRONAUTIQUE:** Météorologie dynamique et prévision numérique; Météorologie aéronautique; Climatologie aéronautique; Météorologie spaciale et éléments de la navigation aérienne. **AGROMÉTÉOROLOGIE:** Éléments de pédologie; Éléments d'agronomie; Éléments d'écologie; Hydrologie générale; Agrométéorologie, observations agrométéorologiques; Géodésie et cartographie; Zootechnie tropicale; Phytogéographie et phytotechnie; Télédétection et télécommunication pour l'agrométéorologie; Protection des cultures; Assistance météorologique à l'agriculture et principes et techniques de drainage et d'irrigation. **HYDROMÉTÉOROLOGIE:** Hydrologie générale; Éléments d'hydraulique appliquée; Hydrogéologie; Hydrométrie; Géodésie et cartographie; Aménagement des eaux et ressources en eau; Prévisions hydrauliques; Hydrologie opérationnelle; Éléments de l'océanographie; Principes et techniques de drainage.

Les demandes d'admission doivent être présentées en avril de la même année. Une excellente connaissance de la langue française est indispensable. Frais (par an; 1988): 2500 Zaires pour les étudiants nationaux et 10000 Zaires pour les étudiants étrangers.

Admiss.: Diplôme d'Etat d'option science ou technique avec 60% des points, ou un diplôme équivalent.

ZAR-2 Ecole Nationale des Métiers Spécialisés, Kinshasa/Gombe TÉL: (243-12) 80 005
 Adresse : Agence nationale de météorologie FAX:
 B.P. 4715, Kinshasa II
 Ecole nationale des métiers spécialisés (E.N.M.S.) E-Mtx: METEOR Kinshasa
 B.P. 8204, KINSHASA-I, Zaïre

ZAR-2-1 Mots-clé: MET Technicien Cl. 3 ProfE-Abini 3 ans Annuel Français 1988

Titre du cours : *Cours de météorologie sanctionnée par un diplôme d'études secondaires - Classe III*

Programme du cours et renseignements complémentaires (ex.: objectifs, horaire, installations, logement, frais, etc.):

Mathématiques; Physique; Français; Géographie; Anglais; Civisme; Technique d'observation et codes météorologiques; Météorologie générale; Electronique; Statistiques; Technique de sondage aérologique et dépouillement; Tenue des documents météorologiques; Pointage et préparation des cartes météorologiques; Analyse synoptique; Protection aéronautique; Météorologie tropicale; Néphanalyse; Transmission et morse; Instruments météorologiques.

Les demandes d'admission doivent être présentées en avril de la même année. Une excellente connaissance de la langue française est indispensable. Frais (par an; 1988): 2500 Zaires pour les étudiants nationaux et 10000 Zaires pour les étudiants étrangers. Logis à l'internat pour un certain nombre d'étudiants.

Admiss.: Un certificat d'études complètes de 5 ans des humanités scientifiques ou techniques. Réussir au concours d'entrée.

Base de données-Compendium OMM des établissements d'enseignement et de la formation professionnelle (EFP) en météorologie et hydrologie opérationnelle. La Fiche Standard du cours.

Pays:		CountryID:	ABC	Couleur:	XXXX
Adresse :			TEL:		
			FAX:		
	E-Mail/Telex/Telegramme:				
Titre du cours:					
CourseID:	ABC-I-1	Classe:		InstitutionID:	ABC-1
Champ:		Activité:		Durée:	
Langue:		Accentuation:		Fréquence:	
Établissement:					
Conditions d'admission:					
Programme du cours :					
Renseignements complémentaires:					
Pour la mise à jour, veuillez communiquer les informations pertinentes au Programme d'enseignement et de formation professionnelle (PEFP) de l'OMM. Si vous désirez faire une mise à jour par le réseau Internet, veuillez consulter la page PEFP : http://www.wmo.ch				Mise à jour:	

ЧАСТЬ III

Введение

ПРАВИЛО, ПРИНЯТОЕ ДЛЯ ЦВЕТОВОГО ОБОЗНАЧЕНИЯ СТРАНИЦ

Первоначальный макет обязательной публикации *Справочник учебных заведений в области метеорологии и оперативной гидрологии* (ВМО–№ 240) был пересмотрен с уделением должного внимания быстрым изменениям, происходящим в образовательной системе по всему миру, и значительному прогрессу, достигнутому в компьютерных технических средствах и программном обеспечении за последние несколько лет. Должное внимание было также уделено значительному разнообразию как между странами, так и внутри их, в отношении существующего опыта и положения дел, включая технологический разрыв между странами, а также в отношении предпочтения стран-членов определенному рабочему языку(ам) ВМО, включая менее общий случай предпочтения различных языков в некоторых учебных учреждениях одной и той же страны.

С тем, чтобы преодолеть эти сдерживающие обстоятельства, при этом сохраняя неизменными (за исключением некоторых редакторских/лингвистических правок) подлинный формат и содержание первичных данных, полученных от стран-членов, было принято правило четырехцветного обозначения страниц в связи с фактически существующим использованием рабочих языков ВМО. С учетом того, что некоторые страны определили и используют более чем один такой язык, правило цветового обозначения страниц более ограничительно в том смысле, что только один цвет отводится каждой стране. Следует также отметить, что правило цветового обозначения страниц является техническим приемом для использования исключительно в целях настоящей публикации и не имеет никакого политического или другого значения.

Настоящий *Справочник учебных заведений в области метеорологии и оперативной гидрологии* был составлен на основе базы данных Access 2.0, которая содержит одновременно три рабочих языка ВМО: английский, французский и испанский. Русский язык как рабочий язык ВМО еще только должен быть включен из-за трудностей технического характера при работе с базой данных в алфавитной среде кириллицы. Соответственно, публикация была разделена на четыре части со следующим цветовым разделением страниц: часть I: *на английском языке – голубой цвет*, ключевые слова и другая информация воспроизводятся на английском языке; часть II: *на французском языке – розовый цвет*, ключевые слова и другая информация воспроизводятся на французском языке; часть III: *на русском языке – зеленый цвет*, ключевые слова воспроизводятся на английском языке, а другая информация (большая часть) – на русском; часть IV: *на испанском языке – желтый цвет*, ключевые слова и другая информация (большая часть) воспроизводятся на испанском языке. Однако необходимо подчеркнуть, что это правило не означает, что учебным языком обязательно является английский, французский, русский или испанский. Например, голубой цвет применяется не только к курсам на английском языке, но также охватывает курсы, преподавание на которых осуществляется на местных языках различных стран, которые отдают предпочтение английскому языку в качестве рабочего языка ВМО. Аналогично, страницы желтого цвета содержат информацию не только о курсах, преподавание на которых осуществляется на испанском языке, но и о курсах на португальском или даже на английском языке (случай, когда приоритет отдается преобладающему влиянию испано- или португалоговорящей среды).

Каждая часть публикации состоит по существу из двух глав:

Глава 1: Индекс курсов

Глава 2: Список учреждений и резюме курсов

вместе с некоторыми краткими пояснениями в каждой главе. Следует отметить, что в то время как содержание этих пояснений является одинаковым во всех частях, смысловое содержание каждой части является полностью различным, т.е. *фактически существующие данные/информация, содержащиеся в одной части, не существуют в других частях*. Занесенная в настоящую публикацию информация содержит сведения о 545 курсах, проводимых в 233 учебных заведениях 95 стран. Фактическое распределение информации о курсах является нижеследующим:

	Часть I — Голубая	Часть II — Розовая	Часть III — Зеленая	Часть IV — Желтая
Страны:	65	13	4	13
Учреждения:	168	25	10	30
Курсы:	375	68	37	65

Для облегчения пользования Справочником, а также удобного оперативного поиска информации в основной базе данных было создано и последовательно используется по всей публикации *стандартное описание курса*. Это стандартное описание курса включает следующие восемь конкретных вопросов: научная область; запланированная деятельность; класс персонала; направленность курса; продолжительность курса; частота курса; язык обучения и дата обновления информации. Для каждого из этих характерных элементов была отобрана ограниченная группа ключевых слов, с тем чтобы рационализировать информацию, введенную в стандартное описание курса, и чтобы информация, предоставленная различными учреждениями, оставалась согласованной от одного курса к другому, даже в многонациональном контексте.

В конце каждой части публикации имеется приложение на белом листе бумаги, представляющее из себя стандартный бланк курса. Копии этого бланка могут быть использованы, в частности, при представлении *обновленной информации* в Секретариат ВМО.

Глава 1

ИНДЕКС КУРСОВ

Пояснение значений кодовой группы CourseID

Так как воспроизводимый на следующей странице перечень составлен в алфавитном порядке названий стран (на английском языке) и в порядке возрастания кодовой группы **CourseID**, краткое описание кодовых групп базы данных, предназначенных для кодирования стран, учреждений и курсов, приводится ниже:

CountryID: трехбуквенный индекс, кодирующий действительное название соответствующей страны; характерный пример: ABC. Применяемые кодовые группы (см. список стран в Содержании) основаны на обозначениях, подготовленных Международной организацией стандартизации. См. *Terminology Bulletin* № 347; United Nations, New York, 1995, UN publication, ISBN 92-1-002063-4.

InstitutionID: шестизначный индекс, используется для определения учебного учреждения, при содействии которого организуется данный курс; характерный пример: ABC--1.

CourseID: девятизначный индекс, используется для нумерации курсов по соответствующим учреждениям; характерный пример: ABC--1--1.

Первые шесть знаков индекса CourseID повторяют индекс InstitutionID, в то время как первые три знака индекса InstitutionID повторяют индекс CountryID.

Индекс курсов

CourseID	Название курса	(только «зеленая» выборка)
AZERBAIJAN; The Azerbaijani Republic		
AZE--1--1	Программа подготовки метеорологов	
AZE--1--2	Программа подготовки гидрологов	
RUSSIAN FEDERATION, The		
RUS--1--1	Методы и технические средства гидрометпрогнозирования; обработка и анализ информации; обслуживание хозяйственной деятельности	
RUS--2--1	Метеорологические наблюдения; эксплуатация гидрометеорологических радиотехнических систем; охрана окружающей среды	
RUS--3--1	Программа подготовки метеорологов	
RUS--3--2	Программа подготовки гидрологов	
RUS--3--3	Программа подготовки океанологов	
RUS--4--1	Бакалавр в области гидрометеорологии	
RUS--4--2	Бакалавр в области экологии и природопользования	
RUS--4--3	Магистр в области гидрометеорологии	
RUS--4--4	Магистр в области экологии и природопользования	
RUS--4--5	Аспирантура (метеорология, гидрология, океанология и экология)	
RUS--4--6	Докторантура (метеорология, гидрология, океанология и экология)	
RUS--4--7	Радиолокационная метеорология	
RUS--4--8	Сверхкраткосрочные прогнозы погоды	
RUS--4--9	Теория управления в метеорологии	
RUS--4--10	Краткосрочные гидрологические прогнозы	
RUS--5--1	Профессиональное образование в областях арктической метеорологии, океанологии и электронных приборов	
RUS--6--1	Российские университеты (в Санкт-Петербурге, Казани, Саратове, Перми, Иркутске, Томске, Владивостоке), имеющие программы по метеорологии, гидрологии и океанологии	
UKRAINE		
UKR--1--1	Магистр в области метеорологии (прогнозирование погоды)	
UKR--1--2	Магистр в области метеорологии (агрометеорология)	
UKR--1--3	Магистр в области метеорологии (радиолокационная метеорология)	
UKR--1--4	Магистр в области метеорологии (системы гидрометеорологического мониторинга)	
UKR--1--5	Магистр в области оперативной гидрологии	
UKR--1--6	Магистр в области океанографии	
UKR--1--7	Магистр в области гидрометеорологии (охрана воздушной и водной среды)	
UKR--1--8	Магистр в области экологии	
UKR--1--9	Магистр в области метеорологии (физическая метеорология)	

UZBEKISTAN, The Republic

UZB--1--1	Подготовка метеорологов, класс III
UZB--1--2	Подготовка специалистов в области гидрометеорологических приборов и электронных систем
UZB--1--3	Специализированный курс для агрометеорологов
UZB--1--4	Специализированный курс для гидрологов
UZB--2--1	Бакалавр в области метеорологии
UZB--2--2	Магистр в области метеорологии (физика атмосферы)
UZB--2--3	Бакалавр в области метеорологии (физика атмосферы)
UZB--2--4	Бакалавр в области гидрологии
UZB--2--5	Магистр в области гидрологии

Глава 2

СПИСОК УЧЕБНЫХ ЗАВЕДЕНИЙ И РЕЗЮМЕ КУРСОВ

Пояснение значений основных ключевых слов

Для каждой страны, включенной в настоящую публикацию, первый заголовок зарезервирован для «краткого названия» страны (на английском языке). Первый абзац содержит соответствующую информацию об адресе первого учебного учреждения — чаще всего учебного заведения заинтересованной национальной метеорологической и гидрологической службы. Следующие абзацы содержат информацию о курсах, которые организуются при содействии упомянутого учреждения. Этот элемент описания первого учреждения сопровождается элементами описания других учреждений, в случае необходимости. Далее следует аналогичная информация в том же порядке по следующей стране.

Каждый абзац курса начинается с индекса CourseID и сопровождается стандартным описанием курса из восьми ключевых слов, касающихся следующих характерных вопросов:

<i>Научная область</i>	<i>Запланированная деятельность</i>	<i>Класс персонала</i>	<i>Направление курса</i>	<i>Продолжительность курса</i>	<i>Частота курса</i>	<i>Язык обучения</i>	<i>Дата обновления информации</i>
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В принципе, простое чтение этих фактических ключевых слов (вспомните, что эти ключевые слова были вставлены в стандартное описание курса соответственно основному направлению соответствующего курса) должно способствовать быстрой оценке соответствия любого курса конкретным интересам пользователя. Наиболее часто используемые ключевые слова и их реальные значения представляются кратко ниже:

Научная область: трехбуквенная кодовая группа, определяющая пять основных научных областей, непосредственно относящихся к метеорологическим и/или гидрологическим предметам, а именно:

MET	метеорология, атмосферные науки и применения, которые относятся к важному влиянию погоды и климата на многие аспекты сельского хозяйства, коммерции и промышленности; см. также термин «Техноклиматология» в <i>Международном метеорологическом словаре</i> , ВМО-№ 182, 1992;
HYD	оперативная гидрология, науки о воде и применения, которые относятся к важному влиянию гидрологического цикла на многие аспекты сельского хозяйства, коммерции и промышленности;
MoH	«гибридные» применения метеорологии и оперативной гидрологии, включая гидрометеорологические исследования и связанные с этим применения техноклиматологии;
ENV	науки об окружающей среде и применения, которые связаны (хотя и отличны от них) с соответствующими применениями метеорологии и оперативной гидрологии; ENV включает применения, связанные с изменением климата, но не с науками о климате;
GEO	геофизические науки, в особенности геофизические дисциплины по жидким средам; GEO включает климатические исследования, которые не подпадают под кодовую группу MET, охватывающую «климатологию атмосферы».

Запланированная деятельность: относится к потенциальной области компетенции, которую получит обучаемый в будущем. Вследствие широкого спектра таких областей были составлены общие базисные коды также в связи с классом персонала. Существует восемь таких кодов:

Scientific	научные исследования и развитие, академическая деятельность; класс 1, в основном 1c;
PredictForec	подготовка основных предсказаний и прогнозов; классы 1-2, в основном 1a или 1b;
AssistForec	оказание помощи прогнозистам и/или адаптивное основные прогнозы; классы 2-3;
Technician	специальная техническая деятельность в поддержку ежедневной оперативной работы; классы 2-3;
Observation	оперативные метеорологические/гидрологические наблюдения; классы 3-4;
InstrumEquip	эксплуатация/обслуживание приборов, телесвязь, компьютеры; классы 1-4;
Operational	общая специализация для любой регулярной деятельности внутри «прогностической цепочки»; классы 1-4;
Clhymet	климатическое/гидрологическое/метеорологическое применение вне «прогностической цепочки»; классы 1-4.

Класс персонала:	является в основном одноцифровой кодовой группой, описывающей классы ВМО (1, 2, 3, 4) для обучения персонала. Персонал класса 1 подразделяется далее на три подкласса:
1a	прошедшие курс обучения по соответствующей университетской программе продолжительностью, как минимум, четыре года;
1b	повышение квалификации, не приводящее к получению более высокой университетской степени;
1c	выпускники, прошедшие курс обучения для получения более высокой университетской степени, степени магистра или доктора.
Смешанный класс	Также используются комбинации вышеупомянутых кодовых групп, например:
1a-1c	программа обучения предназначена как для студентов последних курсов, так и для аспирантов;
1-4	краткая ссылка для оперативного обучения «всех классов», программа в целом;
1a-2	курс, который могут пройти как персонал класса 1a, так и персонал класса 2; и т.д.
Направленность курса:	сложная, частично зашифрованная кодовая группа из одиннадцати знаков, объединенных в форме xxxxx-uuuuu, где:
xxxxx	описывает <u>тип обучения</u> , а именно: от полного университетского образования (следует указывать посредством префикса <i>Univ</i>), до дополнительной университетской профессиональной подготовки (следует указывать посредством префикса <i>Prof</i>). Более точно группу xxxxx необходимо заполнять одним из префиксов <i>Univ</i> или <i>Prof</i> с одним из индексов E, F, S, обозначающих соответственно <i>Education</i> , <i>Formation</i> и <i>Specialization</i> ;
uuuuu	предназначено для сокращенных слов, обозначающих или <u>специальность по работе</u> или <u>уровень обучения</u> ; см. таблицу ниже.

Специальность по работе

Уровень обучения

<i>Aerol</i>	Аэрологическое наблюдение/исследование	<i>AbIni</i>	Ab Initio курс обучения
<i>Aeron</i>	Авиационная метеорология	<i>Advan</i>	Продвинутое обучение; обычно акцент делается на академическую работу, в отличие от группы «Speci» ниже
<i>Agric</i>	Сельскохозяйственная метеорология	<i>Bases</i>	Базовое обучение, хорошее подобие программе из ВМО–№ 258
<i>Atmos</i>	Атмосферная наука и применения	<i>ET&R</i>	Образование, обучение и научные исследования
<i>Clima</i>	Климатология; науки о климате	<i>IDisc</i>	Меж-/многодисциплинарный курс
<i>DataP</i>	Обработка данных в метеорологии и гидрологии	<i>Intro</i>	Вводный курс
<i>DynaM</i>	Динамическая метеорология	<i>Inten</i>	Интенсивный курс
<i>Elect</i>	Электронные приборы/технические средства	<i>Intl</i>	Международный курс; иностранные учащиеся
<i>Engin</i>	Инженер (технология)	<i>Intrm</i>	Промежуточный курс
<i>Envir</i>	Метеорология и гидрология в связи с окружающей средой	<i>Manag</i>	Управление; или в области водных ресурсов, или в области административной работы
<i>HyMet</i>	Гидрометеорология	<i>Natnl</i>	Курс для национальных учащихся
<i>Instr</i>	Классические приборы и методы наблюдений	<i>OJT</i>	Обучение на рабочем месте
<i>Marin</i>	Морская метеорология	<i>R&D</i>	Деятельность по научным исследованиям и развитию
<i>NclPP</i>	Атомные электростанции	<i>Rfrsh</i>	Переподготовка, периодическое обучение; связано частично с вопросами групп «Advan»/«Speci»
<i>Ocean</i>	Вопросы океанографии	<i>Rsrch</i>	В основном фундаментальная научная работа в области наук об атмосфере/океане
<i>PhysM</i>	Физическая метеорология	<i>Speci</i>	Производственная специализация; акцент делается на оперативную работу, в отличие от вышеуказанной группы «Advan»
<i>Pollu</i>	Загрязнение в атмосфере/воде	<i>Varia</i>	Смешанное обучение, неопределенный уровень обучения
<i>Radar</i>	Радиолокационная метеорология		
<i>SateM</i>	Спутниковая метеорология		
<i>Synop</i>	Синоптическая метеорология		
<i>Telec</i>	Метеорологическая телесвязь		
<i>Water</i>	Специальность, связанная с водохозяйственной деятельностью		

Для определенного курса только один суффикс может быть отобран из этого двойного списка ключевых слов.

Продолжительность курса:	относится к фактическому количеству лекционных часов, дней, недель, месяцев, триместров, семестров или академических лет, необходимых для завершения обучения на курсе или по учебной программе. Менее точное определение <i>flexible</i> также используется иногда.
Частота курса:	относится к частоте курса, и используемые кодовые группы включают самоопределяющие сокращения, такие, как <i>Trimest</i> , <i>Semest</i> и т.д. Ключевое слово <i>Ad-hoc</i> используется для обозначения учебного мероприятия, которое проводится нерегулярно, но не обязательно редко; скорее, это ключевое слово означает, что обучение организуется только при появлении определенных потребностей.
Язык обучения:	относится к реальному языку обучения — около 30 различных национальных языков. Иногда, т.е. в тех случаях, когда обучение может проводиться не только на местном языке, а также на английском, французском, русском или испанском языках, сокращения E, F, R или S соответственно используются в качестве дополнительных суффиксов к названию местного языка.
Дата обновления информации:	текст, содержащий дату/время, указывающий, когда определенные данные были представлены; только год выпуска информации воспроизводится в строчке ключевых слов на страницах, относящихся к странам, но в компьютерном варианте имеется полная дата.
Контактный адрес:	относится к (основному) учреждению, при содействии которого организуется курс или модуль курсов. Очевидно, что для каждого учреждения имеется только один адрес и таким образом только одна кодовая группа InstitutionID.
Э-почта/телекс/телеграмма	предпочтительно указывать адрес электронной почты, но при его отсутствии включается соответствующий номер телекса или телеграфный адрес, при наличии.
Телефон/факс:	номера включаются при наличии.

AZERBAIJAN; The Azerbaijani Republic

AZE--1	Baku State University	TEL:
Contact	M.E. Rasulzade	FAX:
Address:	Baku State University	E-M/Tlx:
	Halilov Str. No. 23	
	BAKU - 145, Azerbaijan	

AZE--1--1 Key-words: MET Operational Cl. 1a UnivE-Bases 4 years Annual Russian 1995

Название курса: *Программа подготовки метеорологов*

Программа курса и дополнительная информация:

Гидрометеорологическая информация; основы электроники; атмосферная химия; физическая метеорология; система измерений; динамическая метеорология; синоптическая метеорология; сельскохозяйственная метеорология; космические методы исследований; авиационная метеорология; климат Земли; климатология.

Платное обучение для иностранных граждан; проживание в гостинице.

Квалификация для поступления: Аттестат о полном среднем образовании

AZE--1--2 Key-words: HYD Operational Cl. 1a UnivE-Bases 4 years Annual Russian 1995

Название курса: *Программа подготовки гидрологов*

Программа курса и дополнительная информация:

Гидромеханика и гидравлика; речной сток; гидрологические расчеты; гидрометрия; гидрологический прогноз; гидрофизика; гидрогеохимия; гидрология рек и озер; водные расчеты; гидравлическое и водное хозяйство; гидрометеорологическая информация; моделирование гидрологических процессов; экологический контроль водных ресурсов; гидрологические исследования с использованием спутников и авиации; гидрологические исследования водных объектов; основы мелиорации земель; гидромеханика и гидрология.

Платное обучение для иностранных граждан; проживание в гостинице.

Квалификация для поступления: Аттестат о полном среднем образовании

KGZ--1 The Kyrgyz-Russian Slavonic University (KRSU)

TEL: (3312) 22 06 95

Contact The Kyrgyz-Russian Slavonic University (KRSU)

FAX: (3312) 28 28 59

Address: Kievskaya str., 44
Bishkek, 720000, KRSU
Kyrgyzstan

E-M/tx: KRSU@INFOTEL.BISHKEK.SU

KGZ--1--1 Key-words: MoH Operational Cl. 1a UnivE-Bases 4 years Annual Russian 1997

Название курса: *Бакалавр в области гидрометеорологии*

Программа курса и дополнительная информация (например, цели курса, план, оборудование, условия проживания, оплата и т. д.):

Основы геофизики; физическая метеорология; гидрология; океанография; статистические методы в гидрометеорологии; климатология; методы метеорологических измерений; динамическая метеорология; спутниковая метеорология; агрометеорология; авиационная метеорология; экология; охрана окружающей среды.

Проживание в студенческих общежитиях. Начало ежегодно 1 сентября.

Квалификация для поступления: общие требования для поступающих в университет.

KGZ--1--2 Key-words: MET Scientific Cl. 1c UnivE-Atmos 5 years Annual Russian 1997

Название курса: *Магистр в области метеорологии*

Программа курса и дополнительная информация (например, цели курса, план, оборудование, условия проживания, оплата и т. д.):

Геодезия и картография; физическая метеорология; гидрология; океанография; климатология; гидромеханика; статистические методы в метеорологии; системы измерений; методы спутниковой метеорологии; динамическая метеорология; синоптическая метеорология; региональная синоптическая метеорология; авиационная метеорология; гидродинамические методы в анализе и прогнозе погоды; теория общей циркуляции и климата; агрометеорология; горная метеорология и климатология; строительная климатология; микроклиматология; долгосрочный прогноз погоды; основы биологии; экология; распределение малых газовых составляющих; охрана атмосферы.

Проживание в студенческих общежитиях. Начало ежегодно 1 сентября.

Квалификация для поступления: общие требования для поступающих в университет.

RUSSIAN FEDERATION, The

RUS--1	Институт повышения квалификации руководящих работников и специалистов (ИПК)	ТЕЛ:	095-522 06 24
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Адрес:	143980 г. Железнодорожный-2 Московская обл., Гидрогородок 3А	ФАКС:	095-522 06 14
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RUS--1--1	Key-words: MoH Operational Cl. 1b ProfF-Rfrsh 5-30 days Ad hoc Russian 1995
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Название курса: *Методы и технические средства гидрометеорологического прогнозирования; обработка и анализ информации; обслуживание хозяйственной деятельности*

Программа курса и дополнительная информация:

Метеорологическое, гидрологическое и агрометеорологическое прогнозирование. Гидрометеорологическое обеспечение хозяйственной деятельности. Технические средства и методы наблюдения. Метеорологическое обеспечение гражданской авиации. Мониторинг загрязнения окружающей среды.

Использование аэрокосмической информации в метеорологическом, гидрологическом и агрометеорологическом обслуживании хозяйственной деятельности. Общеорганизационные и коммерческие вопросы деятельности в гидрометеорологии. Применение персональных ЭВМ и компьютерных технологий.

Лица, прибывшие на курсы и семинары, размещаются в студенческом общежитии — по два и четыре человека в комнате. На каждом этаже — кухня и туалетные комнаты. Душевые комнаты, сауна, столовая, бильярдная и междугородный телефон — на первом этаже.

Заявки на курсы от иностранных граждан принимаются в установленном порядке через ВМО или по двустороннему договору. Стоимость оплаты за обучение оговаривается в договоре.
Дополнительная информация — по телефону: 095-522 06 24

Квалификация для поступления: Высшее (университетское) образование по соответствующей специальности

RUS--2	Московский гидрометеорологический колледж	ТЕЛ:	095-522 06 24
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Адрес:	143980 г. Железнодорожный-2 Московская обл., Гидрогородок 3А	ФАКС:	095-522 06 14
		Э-п/телекс:	41 11 17 RUMS RF

RUS--2--1	Key-words: MoH Technician Cl. 3 ProfF-Bases 2-3 years Biennial Russian 1995
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Название курса: *Метеорологические наблюдения; эксплуатация гидрометеорологических радиотехнических систем; охрана окружающей среды*

Программа курса и дополнительная информация:

Метеорологические наблюдения и работы. Обработка и анализ информации. Технические средства наблюдения, их ремонт и обслуживание.

Гидрометеорологические радиотехнические системы, их эксплуатация и обслуживание.

Наблюдения за загрязнением окружающей среды, лабораторный анализ проб и обработка данных.

Лица, прибывшие на курсы и семинары, размещаются в студенческом общежитии — по два и четыре человека в комнате. На каждом этаже — кухня и туалетные комнаты. Душевые комнаты, сауна, столовая, бильярдная и междугородный телефон — на первом этаже.

Заявки на курсы от иностранных граждан принимаются в установленном порядке через ВМО или по двустороннему договору. Документы принимаются до 1 августа. Вступительные экзамены и зачисление производятся в августе. Начало занятий с 1 сентября. Стоимость оплаты за обучение оговаривается в договоре.
Дополнительная информация — по телефону: 095-522 06 24

Квалификация для поступления: Аттестат о среднем образовании

RUS--3	Московский Государственный Университет	ТЕЛ:	095-939 50 04
Адрес:	119899 Москва, Воробьевы горы, 1	ФАКС:	095-939 01 65
RUS--3--1	Key-words: MET PredictForec Cl. 1a UnivE-Atmos	5 years	Annual Russian 1996
Название курса:	<i>Программа подготовки метеорологов</i>		
Квалификация для поступления:	Аттестат о среднем образовании		
RUS--3--2	Key-words: HYD Operational Cl. 1a UnivE-Water	5 years	Annual Russian 1996
Название курса:	<i>Программа подготовки гидрологов</i>		
Квалификация для поступления:	Аттестат о среднем образовании		
RUS--3--3	Key-words: GEO Operational Cl. 1a UnivE-Ocean	5 years	Annual Russian 1996
Название курса:	<i>Программа подготовки океанологов</i>		
Квалификация для поступления:	Аттестат о среднем образовании		
RUS--4	Российский государственный гидрометеорологический институт — Санкт-Петербург	ТЕЛ:	812-221 41 63
Адрес:	195196 Санкт-Петербург Малоохтинский пр., 98	ФАКС:	812-221 60 90
RUS--4--1	Key-words: ME Operational Cl. 1a ProfE-Atmos	4 years	Annual Russian, E,F 1996
Название курса:	<i>Бакалавр в области гидрометеорологии</i>		
Квалификация для поступления:	Полное среднее образование		
RUS--4--2	Key-words: HYD Operational Cl. 1a ProfE-Envir	4 years	Annual Russian, E,F 1996
Название курса:	<i>Бакалавр в области экологии и природопользования</i>		
Квалификация для поступления:	Полное среднее образование		
RUS--4--3	Key-words: MoH Scientific Cl. 1c ProfE-Ocean	2 years	Annual Russian, E 1996
Название курса:	<i>Магистр в области гидрометеорологии</i>		
Квалификация для поступления:	Бакалавр в области гидрометеорологии, см. RUS--4--1		
RUS--4--4	Key-words: ENV Scientific Cl. 1c ProfE-Envir	2 years	Annual Russian, E,F 1996
Название курса:	<i>Магистр в области экологии и природопользования</i>		
Квалификация для поступления:	Бакалавр в области экологии и природопользования, см. RUS--4--2		

RUS--4--5	Key-words: GEO Scientific Cl. 1c ProfS-Rsrch 3 years Ad-hoc Russian		
Название курса:	<i>Аспирантура (метеорология, гидрология, океанология и экология)</i>		
Квалификация для поступления:	Магистр (университетская степень)		
RUS--4--6	Key-words: GEO Scientific Cl. 1c UnivS-R&D 3 years Ad-hoc Russian		
Название курса:	<i>Докторантура (метеорология, гидрология, океанология и экология)</i>		
Квалификация для поступления:	Бакалавр (магистр или более высокая университетская степень)		
RUS--4--7	Key-words: MoH Operational Cl. 1b ProfS-Radar 8 weeks Ad-hoc English		
Название курса:	<i>Радиолокационная метеорология</i>		
Квалификация для поступления:	Метеорологи класса I или II BMO		
RUS--4--8	Key-words: MET PredictForec Cl. 1b ProfS-Synop 3 weeks Ad-hoc English		
Название курса:	<i>Сверхкраткосрочные прогнозы погоды</i>		
Квалификация для поступления:	Метеорологи класса I или II BMO		
RUS--4--9	Key-words: MET Operational Cl. 1b ProfS-Manag 3 weeks Ad-hoc English		
Название курса:	<i>Теория управления в метеорологии</i>		
Квалификация для поступления:	Метеорологи класса I BMO		
RUS--4--10	Key-words: HYD PredictForec Cl. 1b ProfS-Water 2 weeks Ad-hoc English		
Название курса:	<i>Краткосрочные гидрологические прогнозы</i>		
Квалификация для поступления:	Гидрологи-профессионалы по классификации BMO		
RUS--5	Государственная морская академия им. С. О. Макарова, Санкт-Петербург	ТЕЛ:	812-217 19 34
Адрес:	199026 Санкт-Петербург, Косая линия, 15а	ФАКС:	812-217 50 79
RUS--5--1	Key-words: GEO Operational Cl. 1a ProfE-Marin 5 years Annual Russian 1996		
Название курса:	<i>Профессиональное образование в области арктической метеорологии, океанологии и электронных приборов</i>		
Квалификация для поступления:	Аттестат о среднем образовании		

RUS--6	Российские университеты*	ТЕЛ:	(7-95) 252 08 08
Адрес:	Федеральная служба России по гидрометеорологии и мониторингу окружающей среды 123242 Москва Нововаганьковский пер., 12	ФАКС:	(7-95) 253 94 84
		Э-п/телекс:	41.11.17 RUMS RF

RUS--6--1 Key-words: MET Operational Cl. 1a-1c UnivE-Atmos 4-5 years Annual Russian 1996

Название курса: *Программы подготовки метеорологов, гидрологов и океанологов*

За дополнительной информацией просьба обращаться к Постоянному представителю Российской Федерации при ВМО.

Квалификация для поступления: Полное среднее образование, бакалавр или магистр, в зависимости от курса

* В Санкт-Петербурге, Казани, Саратове, Перми, Иркутске, Томске, Владивостоке.

UKR--1	Odessa Hydrometeorological Institute	TEL: (380) 482 636 209
Contact	Odessa Hydrometeorological Institute	FAX: (380) 482 636 308
Address:	Lvovskaya str., 15	
	Odessa, 16	
	Ukraine, 270016	E-M/tx: SYNOP@OGMI.ODESSA.UA

UKR--1--1 Key-words: MET Operational Cl. 1a-1c ProfE-Atmos 5/2 years Annual Russian, E 1998

Название курса: *Магистр в области метеорологии — прогнозирование погоды*

Программа курса и дополнительная информация (например, цели курса, план, оборудование, условия проживания, оплата и т. д.):

Имеются две программы для получения степени магистра:

ПРОГРАММА 1: пятилетняя программа общего и профессионального образования — для выпускников полной средней школы;

ПРОГРАММА 2: полтора-двухгодичная программа специального образования — для обладателей степени бакалавра, завершивших минимальную четырехлетнюю программу в университете. Кандидаты, планирующие заниматься оперативной деятельностью (например, авиационные прогнозы), могут окончить эту программу за 1,5 года, тогда как желающим заниматься научной деятельностью (например, в области синоптической/динамической метеорологии) понадобится еще шесть месяцев для подготовки небольшого исследовательского проекта.

Квалификация для поступления: — полное среднее образование;
— степень бакалавра.

UKR--1--2 Key-words: MET Operational Cl. 1a-1c ProfE-Agric 5/2 years Annual Russian, E 1998

Название курса: *Магистр в области метеорологии — агрометеорология*

Программа курса и дополнительная информация (например, цели курса, план, оборудование, условия проживания, оплата и т. д.):

См. соответствующую информацию для курса UKR--1--1 выше.

Квалификация для поступления: — полное среднее образование;
— степень бакалавра.

UKR--1--3 Key-words: MET Operational Cl. 1a-1c ProfE-Radar 5/2 years Annual Russian, E 1998

Название курса: *Магистр в области метеорологии — радиолокационная метеорология*

Программа курса и дополнительная информация (например, цели курса, план, оборудование, условия проживания, оплата и т. д.):

См. соответствующую информацию для курса UKR--1--1 выше.

Квалификация для поступления: — полное среднее образование;
— степень бакалавра.

UKR--1--4 Key-words: MoH Operational Cl. 1a-1c ProfE-Envir 5/2 years Annual Russian, E 1998

Название курса: *Магистр в области метеорологии — системы гидрометеорологического мониторинга*

Программа курса и дополнительная информация (например, цели курса, план, оборудование, условия проживания, оплата и т. д.):

См. соответствующую информацию для курса UKR--1--1 выше.

Квалификация для поступления: — полное среднее образование;
— степень бакалавра.

UKR--1--5 Key-words: HYD Operational Cl. 1a-1c ProfE-Water 5/2 years Annual Russian, E 1998

Название курса: *Магистр в области оперативной гидрологии*

Программа курса и дополнительная информация (например, цели курса, план, оборудование, условия проживания, оплата и т. д.):

См. соответствующую информацию для курса UKR--1--1 выше.

Квалификация для поступления: — полное среднее образование;
— степень бакалавра.

UKR--1--6 Key-words: ENV Operational Cl. 1a-1c ProfE-Ocean 5/2 years Annual Russian, E 1998

Название курса: *Магистр в области океанографии*

Программа курса и дополнительная информация (например, цели курса, план, оборудование, условия проживания, оплата и т. д.):

См. соответствующую информацию для курса UKR--1--1 выше.

Квалификация для поступления: — полное среднее образование;
— степень бакалавра.

UKR--1--7 Key-words: ENV Operational Cl. 1a-1c ProfE-Pollu 5/2 years Annual Russian, E 1998

Название курса: *Магистр в области гидрометеорологии — охрана воздушной и водной среды*

Программа курса и дополнительная информация (например, цели курса, план, оборудование, условия проживания, оплата и т. д.):

См. соответствующую информацию для курса UKR--1--1 выше.

Квалификация для поступления: — полное среднее образование;
— степень бакалавра.

UKR--1--8 Key-words: MoH Clhymet Cl. 1a-1c ProfE-Envir 5/2 years Annual Russian, E 1998

Название курса: *Магистр в области прикладной экологии*

Программа курса и дополнительная информация (например, цели курса, план, оборудование, условия проживания, оплата и т. д.):

См. соответствующую информацию для курса UKR--1--1 выше.

Квалификация для поступления: — полное среднее образование;
— степень бакалавра.

UKR--1--9 Key-words: MET Operational Cl. 1a-1c ProfE-Instr 5/2 years Annual Russian, E 1998

Название курса: *Магистр в области метеорологии — физическая метеорология*

Программа курса и дополнительная информация (например, цели курса, план, оборудование, условия проживания, оплата и т. д.):

См. соответствующую информацию для курса UKR--1--1 выше.

Квалификация для поступления: — полное среднее образование;
— степень бакалавра.

UZBEKISTAN, The Republic of

UZB--1	Hydrometeorological Technical School, Tashkent			TEL:		
Contact Address:	Hydrometeorological Technical School 45, Kabulova Street Tashkent Uzbekistan			FAX: E-M/Tlx:		
UZB--1--1	Key-words:	MET	Observation Cl. 3-4	ProfF-Instr	18 months Annual	Russian 1996
Название курса: <i>Подготовка метеорологов, класс III</i>						
Программа курса и дополнительная информация:						
Метеорология с основами климатологии; основы агрономии; программное обеспечение гидрометеорологических работ; метеорологические приборы и наблюдения; агрометеорология; агрометеорологические наблюдения; техническая графика; основы геодезии и гидрологии; электротехника с основами электроники; основы автоматики и импульсной техники; автоматические гидрометеорологические системы; синоптическая метеорология; охрана природы.						
Проживание в студенческом общежитии. Начало занятий — 2 сентября, ежегодно; плата — 1000 долл. США в год.						
Квалификация для поступления: Аттестат о среднем образовании						
UZB--1--2	Key-words:	MoH	InstrumEquip	Cl. 2-3	ProfF-Elect	36 months Annual Russian 1996
Название курса: <i>Подготовка специалистов в области гидрометеорологических приборов и электронных систем</i>						
Программа курса и дополнительная информация:						
Метеорология; общая электротехника; основы электротехники и микроэлектроники; техническая графика; основы вычислительной и микропроцессорной техники; охрана природы; автоматика и телеметрия; основы радиотехники и антенны; аэрология; основы радиолокации и радиометеорологии; радиотехнические измерения; радиоприемные устройства; радиопередающие устройства; импульсная техника; устройство и эксплуатация РЛС; синоптическая метеорология; устройства автоматизированной обработки аэрологической информации.						
Проживание в студенческом общежитии. Начало занятий — 2 сентября, ежегодно; плата — 1000 долл. США в год.						
Квалификация для поступления: Аттестат о среднем образовании						
UZB--1--3	Key-words:	MET	Operational	Cl. 2	ProfS-Agric	2 weeks Ad-hoc Russian
Название курса: <i>Специализированный курс для агрометеорологов</i>						
Плата — 30 долл. США в сутки.						
Квалификация для поступления: Метеорологи класса II ВМО						
UZB--1--4	Key-words:	HYD	Operational	Cl. 1-2	ProfS-Water	2 weeks Ad-hoc Russian
Название курса: <i>Специализированный курс для гидрологов</i>						
Плата — 30 долл. США в сутки.						
Квалификация для поступления: Гидрологи — профессионалы и техники по классификации ВМО						

UZB--2	Tashkent State University	TEL: (7-3712) 46 02 24
Contact Address:	Tashkent State University Vuzgorodok, Tashkent 700095 Uzbekistan	FAX: E-M/Tlx:

UZB--2--1 Key-words: MET Clhymet Cl. 1a UnivE-Bases 4 years Annual Russian 1996

Название курса: *Бакалавр в области метеорологии*

Программа курса и дополнительная информация:

Физика атмосферы; синоптическая метеорология; климатология; методы обработки и анализа информации; информационно-измерительные метеорологические системы; космическая метеорология; экология с основами гидроэкологии; методы зондирования окружающей среды; гидрометеорологические аспекты охраны окружающей среды; экономика гидрометеорологического обеспечения народного хозяйства; статистические методы в гидрометеорологии; синоптические процессы Средней Азии; математическое моделирование гидрометеорологических процессов; динамическая метеорология; основы прикладной метеорологии; физика облаков и осадков; метеорологические прогнозы.

Проживание в студенческом общежитии. Начало занятий — 2 сентября, ежегодно.

Квалификация для поступления: Аттестат о среднем образовании

UZB--2--2 Key-words: MET Scientific Cl. 1c UnivE-Atmos 5 years Annual Russian 1996

Название курса: *Магистр в области метеорологии (физики атмосферы)*

Программа курса и дополнительная информация:

Методы исследования атмосферы; физика атмосферы; основы экологии и охрана атмосферы; динамическая метеорология; синоптическая метеорология (часть 1); синоптическая метеорология (часть 2); физика облаков и осадков; космическая метеорология; численные методы прогноза; методы прогноза погоды; синоптические процессы Средней Азии; авиационная метеорология; общая циркуляция атмосферы и долгосрочные прогнозы погоды; статистические методы в метеорологии; методы измерений в свободной атмосфере.

Проживание в студенческом общежитии. Начало занятий — 2 сентября, ежегодно.

Квалификация для поступления: Аттестат о среднем образовании

UZB--2--3 Key-words: MET Operational Cl. 1a UnivE-Atmos 4 years Annual Russian 1996

Название курса: *Бакалавр в области метеорологии (физики атмосферы)*

Программа курса и дополнительная информация:

Физика атмосферы; информационно-измерительные системы; методы зондирования окружающей среды; динамическая метеорология; синоптическая метеорология; методы обработки и анализа метеорологической информации; космическая метеорология; основы метеорологических прогнозов.

Проживание в студенческом общежитии. Начало занятий — 2 сентября, ежегодно.

Квалификация для поступления: Аттестат о среднем образовании

UZB--2--4 Key-words: MoH Operational Cl. 1a UnivE-Water 4 years Annual Russian 1996

Название курса: *Бакалавр в области гидрологии*

Программа курса и дополнительная информация:

Общая гидрология; гидрометрия; общая речная гидравлика; гидрогеология; гидрофизика; океанология; гидрография Центральной Азии; гидрометеорологические аспекты охраны окружающей среды; основы гидротехники; математические модели гидрометеорологических процессов; гидрохимия водоемов; охрана труда в гидрометеорологии; экономика гидрометеорологического обеспечения народного хозяйства; речной сток и основы гидрологических расчетов; русловые процессы; водное хозяйство и водохозяйственные расчеты; гидрологические прогнозы; статистические методы в гидрологии.

Проживание в студенческом общежитии. Начало занятий — 2 сентября, ежегодно.

Квалификация для поступления: Аттестат о среднем образовании

UZB--2--5 Key-words: HYD Scientific Cl. 1a UnivE-HyMet 5 years Annual Russian 1996

Название курса: *Магистр в области гидрологии*

Программа курса и дополнительная информация:

ЭВМ и программирование; гидрометрия; водно-технические изыскания; общая гидрология; гидрофизика; водно-балансовые исследования; общая и речная гидравлика; гидрологические расчеты; математические модели в гидрологии; гидрография Центральной Азии; аэрокосмические и спутниковые исследования в гидрологии; экология и охрана вод суши; мелиоративная гидрология; гидрологические прогнозы; прогноз качества природных вод; гидрометеорологическое обеспечение народного хозяйства; динамика русловых потоков; водное хозяйство и водохозяйственные расчеты; способы очистки промышленных вод; экологический мониторинг; гляциология; лимнология; гидробиология и гидрохимия с основами экологии; гидротехника.

Проживание в студенческом общежитии. Начало занятий — 2 сентября, ежегодно.

Квалификация для поступления: Аттестат о среднем образовании

БАЗА ДАННЫХ ВМО — СПРАВОЧНИК УЧЕБНЫХ ЗАВЕДЕНИЙ В ОБЛАСТИ
МЕТЕОРОЛОГИИ И ОПЕРАТИВНОЙ ГИДРОЛОГИИ; Стандартный бланк курса

Название
страны:

CountryID: ABC

Цвет: XXXX

Контактный
адрес:

ТЕЛ:

ФАКС:

Э-почта/телекс/телеграмма:

Название
курса:

CourseID: ABC--1--1

Класс:

InstitutionID: ABC--1

Область:

Деятельность:

Продолжительность:

Язык:

Направленность:

Частота:

Учебное
заведение

Квалификация для поступления:

Программа курса:

Дополнительная информация:

Для облегчения обновления базы данных просьба заполненный бланк
направить в Департамент образования и подготовки кадров ВМО
(ETRP). При обновлении информации через Интернет просьба
использовать страничку ETRP, указав <http://www.wmo.ch>

Дата обновления
информации

PARTE IV

Introducción

CONVENCIÓN ADOPTADA PARA LOS COLORES

Se ha reconsiderado la concepción original de la publicación obligatoria *Compendium of Training Facilities for Meteorology and Operational Hydrology* (WMO-Nº 240), teniendo en cuenta los rápidos cambios que se han producido en el sistema educativo del mundo entero y los notables progresos de la informática en los últimos años, sin olvidar la gran diversidad entre países y dentro de ellos con respecto a la experiencia y las circunstancias existentes, incluida la disparidad tecnológica entre países, así como lo relativo a la preferencia de los Miembros por determinado idioma o idiomas de comunicación de la OMM, incluido el caso menos común de una preferencia lingüística diferente de algunas instituciones docentes del mismo país.

Para responder a esos condicionamientos – sin que resultaran afectados el formato ni el contenido de los datos originales recibidos de los Miembros (salvo en el caso de algunas correcciones de forma y lingüísticas) – se concibió una convención de cuatro colores, relacionada en general con el uso actual de los idiomas de comunicación de la OMM. Como algunos países han designado, y utilizado, más de uno de esos idiomas, la convención es más restrictiva en el sentido de que sólo se asigna un color a cada país. También procede señalar que esta convención de colores es un medio técnico que sólo debe utilizarse para los fines de la presente publicación, y no tiene ningún significado político ni de otro tipo.

El actual *Compendio de instituciones de enseñanza y formación profesional en meteorología e hidrología operativa*, extraído de una base de datos Access 2.0, comprende simultáneamente tres idiomas de trabajo de la OMM: español, francés e inglés. El ruso, que es el otro idioma de trabajo de la OMM, será incluido posteriormente por dificultades técnicas en la operación de la base de datos en el entorno del alfabeto cirílico. Por lo tanto, la publicación fue dividida en cuatro partes con sus correspondientes códigos de colores: Parte I, *inglés-azul*, palabras clave y demás información en inglés; Parte II, *francés-rosa*, palabras clave y demás información en francés; Parte III, *ruso-verde*, palabras clave en inglés y la mayoría de la información en ruso; Parte VI, *español-amarillo*, palabras clave y la mayoría de la información en español. Sin embargo, procede señalar que esta convención no significa que el idioma de la enseñanza sea necesariamente el español, el francés o el inglés. Por ejemplo, el código azul no sólo se refiere a los cursos impartidos en inglés, sino que abarca también cursos en los idiomas locales de los diversos países que prefieren el inglés como idioma de trabajo de la OMM. Del mismo modo, el código amarillo no sólo comprende los cursos impartidos en español, sino también en portugués o incluso en inglés (como cuando se da prioridad al entorno de habla española o portuguesa predominante).

Cada una de estas tres partes se compone esencialmente de dos capítulos:

- Capítulo 1: Índice de cursos
- Capítulo 2: Repertorio de instituciones y sumario de cursos

con algunas notas explicativas breves en cada capítulo. Debe señalarse, que si bien el contenido de esas notas es el mismo en las cuatro partes, el contenido sustantivo de cada parte es totalmente diferente, es decir, que *los datos y la información contenidos en una parte no existen en las otras Partes*. La información contenida en la publicación corresponde a 545 cursos impartidos en 233 instituciones docentes, de 95 países. La distribución real es la siguiente:

	Parte I – Azul	Parte II – Rosa	Parte III – Verde	Parte IV – Amarillo
Países:	65	13	4	13
Instituciones:	168	25	10	30
Cursos:	375	68	37	65

Con objeto de facilitar la utilización del Compendio, así como para extraer fácilmente información de la base de datos se concibió y utilizó en todo momento una *lista de control del curso* específica. Esta lista normalizada comprende las ocho cuestiones siguientes: área científica, actividad prevista, clase de personal, énfasis del curso, duración del curso, frecuencia del curso, idioma de la enseñanza y fecha de validez de la información. Para cada una de estos puntos genéricos se seleccionó una serie limitada de palabras clave con el fin de simplificar la información introducida en la lista de control del curso, de manera que la información proporcionada por las diversas instituciones sea coherente entre dos cursos, incluso en un contexto multinacional.

Al final de cada parte se anexa en una hoja blanca la ficha estándar del curso. Se pueden utilizar copias de esta ficha, en particular cuando se somete a la Secretaría de la OMM *información para actualización*.

Capítulo 1

ÍNDICE DE CURSOS

Notas explicativas en relación con el significado del código CourseID

Como el texto de las páginas siguientes figura en orden alfabético por países (basándose en el orden inglés) y de manera ascendente respecto a CourseID, a continuación se describen brevemente los códigos de la base de datos designados para países, instituciones y cursos:

- CountryID:** índice de tres letras con el que se codifica el nombre del país; ejemplo genérico: ABC. Los códigos (véase la lista de los países informantes en el índice) se basan en las designaciones hechas por la Organización Internacional de Normalización. Véase el Boletín de Terminología N° 347; Naciones Unidas, Nueva York, 1995, publicación de las NU, ISBN 92-1-002063-4.
- InstitutionID:** índice de seis caracteres utilizado para identificar la institución docente bajo cuyos auspicios se organiza el curso; ejemplo genérico: ABC--1.
- CourseID:** índice de nueve caracteres utilizado para numerar los cursos, de acuerdo con las respectivas instituciones; ejemplo genérico: ABC--1--1.

Los seis primeros caracteres del CourseID designan a la InstitutionID, en tanto que los tres primeros caracteres de la InstitutionID reproducen el CountryID.

Índice de Cursos

CourseID	Título del Curso	(Solamente selección "Amar")
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ARGENTINA; The Argentine Republic

- ARG-1-1 Nefoanálisis
- ARG-1-2 Meteorología Operativa Aeronáutica
- ARG-1-3 Radar
- ARG-1-4 Especialización en Meteorología Antártica
- ARG-1-5 Inspector Meteorológico
- ARG-1-6 Observador Aerológico (Radiosondeísta)
- ARG-1-7 Técnico en mantenimiento de instrumental meteorológico. (Clase IV)
- ARG-2-1 Curso internacional de hidrología con énfasis en hidrología subterránea
- ARG-3-1 Licenciatura en ciencias de la atmósfera
- ARG-3-2 Bachillerato Universitario en Ciencias de la Atmósfera
- ARG-3-3 Licenciatura en Oceanografía
- ARG-3-4 Doctor de la Universidad de Buenos Aires (Área: Ciencias de la atmósfera)
- ARG-3-5 Magister de la Universidad de Buenos Aires. (Orientación: Meteorología Agrícola)

BRAZIL, The Federative Republic of

- BRA-1-1 B.Sc. in Meteorology
- BRA-2-1 Técnicas de Medição de Vazão em Grandes Rios
- BRA-3-1 Treinamento de Meteorologistas; Meteorologist Training - M.Sc. , Ph.D. levels
- BRA-4-1 Post-Graduation Program in Water Resources and Sanitation.
- BRA-5-1 Curso de Subespecialización en Meteorología.
- BRA-6-1 Hydrosedimentology for Reservoirs.
- BRA-7-1 Bachelors Degree in Meteorology (B.Sc.)
- BRA-8-1 Graduate (B.Sc.), Master (M.Sc.) Doctor (Ph.D.) in Meteorology
- BRA-9-1 Meteorología Agrícola (M.Sc.)

CHILE, The Republic of

- CHL-1-1 Ingeniero de ejecución en Meteorología
- CHL-1-2 Técnico Operador en Observaciones Meteorológicas
- CHL-1-3 Técnico Operador en Instrumentos Meteorológicos
- CHL-2-1 Licenciatura en Meteorología.

COLOMBIA, The Republic of

- COL-1-1 Formación de Técnicos Clase IV en Meteorología Agrícola
- COL-1-2 Curso internacional para la formación de técnicos en instrumentos hidrometeorológicos

COSTA RICA, The Republic of

- CRI-1-1 Formación de Técnicos : Meteorólogos Clase II
- CRI-1-2 Maestría en Ciencias de la Atmósfera (M.Sc.)
- CRI-1-3 Especialidad en Meteorología Aplicada
- CRI-1-4 Licenciatura en Meteorología; Especialización en una rama de la Meteorología
- CRI-1-5 Bachillerato en Meteorología (B.Sc.).

GUATEMALA, The Republic of

- GTM-1-1 Curso de Meteorólogos Clase III

MEXICO; The United Mexican States

- MEX-1-1 Formación profesional de asistentes de pronosticadores

CourseID Título del Curso**(Solamente selección "Amar")**

- MEX-2-1 Formación profesional de observadores (Clase IV) de meteorología
- MEX-2-2 Formación profesional de Pronosticadores Meteorológicos Aeronáuticos
- MEX-2-3 Formación profesional de observadores (Clase IV) de meteorología aeronáutica

MOZAMBIQUE, The Republic of

- MOZ-1-1 Formación profesional de observadores (Clase III) de meteorología
- MOZ-1-2 Formación profesional de observadores (Clase IV) de meteorología

PARAGUAY, The Republic of

- PRY-1-1 Técnico Superior en Meteorología

PORTUGAL; The Portuguese Republic

- PRT-1-1 Pasantía en Meteorología - Clase I
- PRT-1-2 Entrenamiento de meteorólogo(s) - Clase II (OMM)
- PRT-1-3 Observadores - Meteorología Clase III
- PRT-1-4 Observadores - Meteorología Clase IV
- PRT-2-1 "Licenciatura" en Ciencias Geofísicas
- PRT-3-1 "Mestrado" (M.Sc.) en física del medio ambiente y "Doutorado" (Ph.D.) en meteorología
- PRT-4-1 "Licenciatura" (B.Sc.) en Física

SPAIN, The Kingdom of

- ESP-1-1 Meteorólogos Facultativos
- ESP-1-2 Ayudantes de Meteorología
- ESP-1-3 Observadores de Meteorología
- ESP-1-4 Curso Internacional de Meteorología
- ESP-2-1 Curso Internacional sobre Hidrología General y Aplicada

URUGUAY, The Eastern Republic of

- URY-1-1 Meteorólogo Técnico Clase IV
- URY-1-2 Meteorólogo Técnico Clase III
- URY-1-3 Meteorólogo Técnico Clase II con las orientaciones en Sinóptica, Climatológica e Instrumental
- URY-1-4 Curso de Habilitación para Observadores Meteorológicos

VENEZUELA, The Republic of

- VEN-1-1 Cursos varios sobre desarrollo de recursos hidráulicos y el uso del suelo
- VEN-2-1 Hidrología Operativa
- VEN-2-2 Auxiliar de Meteorología e Hidrología
- VEN-2-3 Hidrología Operativa para Técnicos Medios
- VEN-2-4 Meteorología Aplicada a la Aeronáutica
- VEN-2-5 Meteorología Agrícola
- VEN-2-6 Curso básico de diagnóstico climatológico
- VEN-2-7 Curso básico de hidrometeorología tropical

Capítulo 2

REPERTORIO DE INSTITUCIONES Y SUMARIO DE CURSOS

Notas explicativas sobre el significado de las principales palabras clave

Para cada país que ha contribuido a la presente a la publicación, el primer encabezamiento se reservó para el “Nombre abreviado” (en inglés) del país. El primer párrafo contiene la información pertinente sobre la dirección de la primera institución docente, que la mayoría de las veces es la dependencia de formación del Servicio Meteorológico e Hidrológico Nacional correspondiente. En los siguientes párrafos se ofrece información sobre los cursos organizados bajo los auspicios de dicha institución. Esta entrada de la primera institución va seguida de las de otras instituciones, cuando procede. A continuación figura la información del país siguiente, en que se repite la misma estructura.

El párrafo de cada curso comienza con el CourseID, seguido de una lista de control del curso normalizada de ocho palabras claves relativas concretamente a las siguientes cuestiones genéricas:

Área científica	Actividad prevista	Clase de personal	Énfasis del curso	Duración del curso	Frecuencia del curso	Idioma de la enseñanza	Actualización de la información
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En principio, la simple lectura de las palabras clave (recuérdese que estas palabras clave se insertaron en la lista de control del curso de acuerdo con los aspectos fundamentales de cada uno de ellos) debe permitir evaluar rápidamente si un curso es apropiado en relación con los intereses concretos del usuario. A continuación se exponen brevemente las palabras clave más utilizadas y sus verdaderos significados:

Área científica: código de tres letras con el que se designan cinco áreas científicas principales de interés directo para temas meteorológicos y/o hidrológicos, a saber:

MET Meteorología, ciencias de la atmósfera y aplicaciones en relación con la considerable influencia del tiempo y el clima sobre numerosos aspectos de la agricultura, el comercio y la industria; véase también el término “Tecnoclimatología” en el *Vocabulario Meteorológico Internacional*, OMM-N° 182, 1992;

HYD Hidrología operativa, ciencias del agua y aplicaciones, en relación con la considerable influencia del ciclo hidrológico sobre numerosos aspectos de la agricultura, el comercio y la industria;

MoH Aplicaciones “híbridas” de la meteorología y la hidrología operativa, incluidos estudios sobre hidrometeorología y aplicaciones tecnoclimatológicas afines;

ENV Ciencias del medio ambiente y aplicaciones relacionadas con las de la meteorología y la hidrología operativa propiamente dichas, aunque diferentes de ellas; ENV comprende aplicaciones relacionadas con el cambio climático, pero no las ciencias del clima;

GEO Ciencias geofísicas, en particular disciplinas de fluidos geofísicos; GEO comprende estudios sobre el clima que rebasan la “climatología de la atmósfera” abarcada por MET.

Actividad prevista: se refiere al posible ámbito de competencia que asumirá el alumno en el futuro. En vista del amplio espectro de esos ámbitos, se concibieron códigos de referencia de carácter general, también en relación con la clase de personal. Existen ocho de esos códigos:

Científica	Investigación y desarrollo, actividades académicas; clase 1, principalmente 1c;
Pronóstico	Preparación de predicciones y pronósticos principales; clase 1-2, principalmente 1a o 1b;
AyudPronósti	Asistencia a pronosticadores y/o y adaptación de los principales pronósticos; clase 2-3;
Técnico	Actividad técnica específica en apoyo de operaciones diarias; clase 2-3;
Observación	Observación meteorológica/hidrológica operativa; clase 3-4;
InstrumEquip	Manejo/mantenimiento de instrumentos, telecomunicación, ordenadores; clase 1-4;
Operacional	Amplia designación de cualquier actividad regular en la “cadena de pronósticos”; clase 1-4;
Clhymet	Aplicación ClimaHidroMeteo fuera de la “cadena de pronósticos”; clase 1-4.

Clase de Personal:	es principalmente un código de dígito solamente que describe las clases de personal de la OMM (1, 2, 3, 4) que ha de formarse. El personal de la clase 1 se subdividió además en tres subclases:
1a	graduación de un programa universitario pertinente de 4 años como mínimo;
1b	formación de postgrado no conducente a un título universitario superior;
1c	seguimiento por graduados de un curso con titulación universitaria superior, master, doctorado.

Clase combinada También se utilizan combinaciones de los citados códigos, por ejemplo:

1a-1c	programa de formación para subgraduados y postgraduados;
1-4	breve referencia para la formación operativa de "todas las clases"; el conjunto como un todo;
1a-2	Curso a que puede asistir personal de clase 1a y de clase 2; etc.

Énfasis del curso: es un código compuesto, parcialmente cifrado, de once caracteres combinados en la forma xxxxx-yyyyy, en donde:

xxxxx	denota el tipo de instrucción, es decir: desde la educación oficial universitaria--designada mediante el prefijo Univ, hasta la formación profesional extrauniversitaria--designada mediante el prefijo Prof. Más concretamente, xxxxx ha de cubrirse por uno de los prefijos Univ o Prof, seguido de uno de los subfijos E, F, S -- que significan educación, formación y especialización, respectivamente;
yyyyy	se aplica a palabras abreviadas sobre la especialidad en el empleo o el nivel de instrucción; véanse los cuadros en la sección siguiente Ejemplos de consulta rápida.

Especialidad del empleo		Nivel de instrucción	
<i>Aerol</i>	<i>Observación aerológica/estudio</i>	<i>AbIni</i>	<i>Formación ab initio del curso</i>
<i>Aeron</i>	<i>Meteorología aeronáutica</i>	<i>Super</i>	<i>Formación superior; normalmente para trabajo académico; a diferencia de "Espec" infra</i>
<i>Agric</i>	<i>Meteorología agrícola</i>		
<i>Atmos</i>	<i>Ciencias de la atmósfera y aplicaciones</i>	<i>Bases</i>	<i>Formación fundamental, bastante similar a los planes de estudio de OMM-Nº 258</i>
<i>Clima</i>	<i>Climatología; ciencias del clima</i>		
<i>Data P</i>	<i>Proceso de datos en M y H</i>	<i>EF & I</i>	<i>Enseñanza, Formación e investigación</i>
<i>DynaM</i>	<i>Meteorología dinámica</i>	<i>IDisc</i>	<i>Curso inter/pluridisciplinario</i>
<i>Elect</i>	<i>Inst. electrónicos/equipo</i>	<i>Intro</i>	<i>Curso introductorio</i>
<i>Ingen</i>	<i>Ingeniero/Ingeniería</i>	<i>Inten</i>	<i>Curso intensivo</i>
<i>Envir</i>	<i>M y H del medio ambiente</i>	<i>Intl</i>	<i>Curso internacional, alumnos extranjeros</i>
<i>HyMet</i>	<i>Hidrometeorología</i>	<i>Intrm</i>	<i>Curso de nivel intermedio</i>
<i>Instr</i>	<i>Instrumentos y métodos de observación clásicos</i>	<i>Gestión</i>	<i>Gestión; en recursos hidráulicos o administración de oficinas</i>
<i>Marin</i>	<i>Meteorología marina</i>	<i>Natnl</i>	<i>Curso para alumnos nacionales</i>
<i>NclPP</i>	<i>Centrales de energía nuclear</i>	<i>FeE</i>	<i>Formación en el empleo</i>
<i>Ocean</i>	<i>Materias oceanográficas</i>	<i>I & D</i>	<i>Actividad de Investigación y Desarrollo</i>
<i>PhysM</i>	<i>Meteorología física</i>	<i>Repas</i>	<i>Repaso, formación periódica; relacionado en parte con temas de "super/Espec"</i>
<i>Pollu</i>	<i>Contaminación de la atmósfera/del agua</i>		
<i>Radar</i>	<i>Meteorología de radar</i>	<i>Inves</i>	<i>Principalmente investigación fundamental en ciencias de la atmósfera/de los océanos</i>
<i>SateM</i>	<i>Meteorología de satélite</i>		
<i>Synop</i>	<i>Meteorología sinóptica</i>		
<i>Telec</i>	<i>Met-Telecomunicaciones</i>	<i>Espec</i>	<i>Especialización en el empleo; formación práctica; a diferencia de "Super" supra</i>
<i>Agua</i>	<i>Especialidad relacionada con el agua</i>	<i>Varios</i>	<i>Formación diversa, nivel de instrucción no especificado</i>

Para determinado curso, sólo puede elegirse un sufijo de esta doble lista de palabras clave

Duración del curso:	se refiere al número real de horas de clase, días, semanas, meses, trimestres o años académicos necesarios para completar el curso o el programa educativo. También se utiliza a veces la designación menos precisa flexible.
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Frecuencia del curso:	se refiere a la frecuencia del curso, y los códigos utilizados comprenden abreviaturas que no requieren explicación como Trimestre, Semestre, etc. La palabra clave Ad-hoc se utiliza para designar una actividad docente que no es regular, pero no necesariamente aleatoria; significa más bien que la formación se organiza sólo cuando surgen ciertas necesidades.
Idioma de la enseñanza:	se refiere al verdadero idioma de la enseñanza: unos 30 idiomas nacionales diferentes. Ocasionalmente, es decir, en aquellos casos en que la enseñanza puede impartirse no sólo en el idioma local, sino también en español, francés inglés o ruso, se utilizan las abreviaturas S, F, E, R, respectivamente, como sufijos de la denominación del idioma local.
Validez de la información:	es un texto de día/hora que indica cuándo se han producido los datos aportados; el año de actualización se presenta sólo en la línea de palabra clave de las páginas de los países, pero en la versión informatizada se dispone de la Fecha completa
Dirección de contacto:	se refiere a la (principal) institución bajo cuyos auspicios se organiza el curso o el módulo de cursos. Evidentemente, para cada institución sólo hay una dirección y, por lo tanto, sólo una InstitutionID.
Correo E/Télex/Cable:	se refiere, en la medida de lo posible, a la dirección de correo E, pero, cuando no la había, se registró el número de télex o el código de cable, según los casos.
Teléfono:	se registraron los números disponibles
Facsímil:	se registraron los números disponibles

ARGENTINA; The Argentine Republic

Última actualización: 25-May-98

ARG-1 Centro Regional de Formación Profesional, SMN, Buenos Aires

Dirección: Centro Regional de Formación Profesional
Componente Servicio Meteorológico Nacional
25 de Mayo 658
1002 BUENOS AIRES, Argentina

TEL: (54-1) 514-4253
FAX: (54-1) 514-4225
E-Mail: web@meteofa.mil.ar

ARG-1-1 Claves: MET Operacional Cl. 1b ProfS-SateM 16 semanas Anual Español 1998

Título del curso: *Nefoanálisis*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Elementos de cosmografía; nociones sobre el vehículo espacial; localización geográfica; interpretación de las imágenes en visual e infrarrojo; confección de nefoanálisis; utilización de las imágenes satelitales en el análisis sinóptico.

El Servicio Meteorológico Nacional posee comedor con tarifas económicas. Costos (1996): US\$ 1050.

Admis. Licenciado en Ciencias Meteorológicas (Clase I) o Bachiller en Ciencias Meteorológicas (Clase II).

ARG-1-2 Claves: MET Operacional Cl. 1b ProfF-Aeron 12 semanas Anual Español 1998

Título del curso: *Meteorología Operativa Aeronáutica*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Legislación aeronáutica, documentación OACI; pronóstico aeronáutico; climatología aplicada; micrometeorología; aplicación operativa de las bases teóricas; interrelaciones con ARO-AIS-ACC; comunicaciones; aviación; meteorología y accidentes de aviación; pronósticos orientados a las distintas actividades aéreas.

El Servicio Meteorológico Nacional posee comedor con tarifas económicas. Costos (1996): US\$ 1050.

Admis. Licenciado en Ciencias de la Atmósfera (Clase I) o Bachiller en Ciencias de la Atmósfera (Clase II).

ARG-1-3 Claves: MET Operacional Cl. 1b ProfF-Radar 3 meses Anual Español 1998

Título del curso: *Radar*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

TEORIA DEL RADAR. Las ondas electromagnéticas y la detección de blancos. La ecuación del Radar y su aplicación a blancos meteorológicos. Las longitudes de onda y la medición de parámetros meteorológicos. Medición de intensidad de la precipitación líquida y sólida. Relación Z/R en sus distintas variantes. Presentación de los ecos en el radar. Identificación de los mismos. Cálculo de velocidades, rumbos, intensidad, altura de topos. PRÁCTICA INTENSIVA. Manejo de controles. Clave RADOB.

El Servicio Meteorológico Nacional posee comedor con tarifas económicas. Costos (1996): US\$ 1050.

Admis. Licenciado en Ciencias de la Atmósfera (Clase I) o Bachiller en Ciencias de la Atmósfera (Clase II)

ARG-1-4 Claves: MET Operacional Cl. 1b ProfF-Inten 3 meses Anual Español 1998

Título del curso: *Especialización en Meteorología Antártica*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

El curso está compuesto de las siguientes materias: Instrumentos, Métodos de Observación y Claves; Climatología Antártica; Meteorología Dinámica y Sinóptica; Antártica; Meteorología Física Antártica; Información satelital.

El Servicio Meteorológico Nacional posee comedor con tarifas económicas. Costos (1996): US\$ 1050.

Admis. Licenciado en Ciencias de la Atmósfera (Clase I) o Bachiller en Ciencias de la Atmósfera (Clase II).

ARG-1-5 Claves: MET Operacional Cl. 3 ProfF-Bases 8 meses Anual Español 1998

Título del curso: *Inspector Meteorológico*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

PARTE SELECTIVA: los inscriptos serán evaluados en matemáticas y física. Los aprobados inician la parte formativa. Matemáticas (aritmética, trigonometría y álgebra). Evaluación. Física. Meteorología sinóptica.



PARTE FORMATIVA: se imparte en el Servicio Meteorológico Nacional (24 semanas). Instalación e

inspección, instrumental meteorológico I, cómputos y tablas, práctica de instrumental I, topografía y geodesia. PARTE PRÁCTICA: en el Servicio Meteorológico Nacional (6 semanas). Consiste en la realización de instalación e inspección de estaciones de la Red del Servicio Meteorológico Nacional, bajo la supervisión de un inspector del mismo.

El Servicio Meteorológico Nacional posee comedor con tarifas económicas. Costos (1996): US\$ 2 800.-

Admis. Meteorólogo Clase IV (observador Meteorológico) y experiencia no menor de cinco años

ARG-1-6	Claves: MET Operacional Cl. 3	ProfF-Aerol	6 meses	Ad hoc	Español	1998
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Título del curso: *Observador Aerológico (Radiosondeísta)*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Aerología teórica; nociones del comportamiento del viento y presión atmosférica; Los diagramas termodinámicos; Estabilidad e inestabilidad atmosférica; Instrumental aerológico: teoría del mismo; Descripción y uso de los equipos receptores. Práctica de observación aerológica: calibrado, lanzamiento y recepción, cálculo y cifrado.

El Servicio Meteorológico cuenta con comedor con tarifas económicas. Se deben enviar las solicitudes de inscripción con una antelación no menor a 6 meses con respecto al comienzo. La frecuencia del curso depende de los inscriptos y los requerimientos. Costos (1996): US\$ 2 100.-

Admis. Estudios secundarios completos y experiencia no menor a 3 años como observador de superficie.

ARG-1-7	Claves: MET InstrumEquip Cl. 4	ProfF-Instr	8 meses	Anual	Español	1998
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Título del curso: *Técnico en mantenimiento de instrumental meteorológico. (Clase IV)*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Taller de instrumental: Reparación, armado y desarmado de instrumental meteorológico. Laboratorio de instrumental: a) Purificación de mercurio, llenado de tubos barométricos, calibración y comparación de barómetros y barógrafos. b) Calibración y comparación de termómetros, termógrafos, higrógrafos, termohigrógrafos, teletermógrafos eléctricos. c) Calibración y comparación de anemómetros y anemógrafos en túnel de viento. d) Introducción al instrumental electrónico: radiosondas, radioteodolitos, radar meteorológico y nefobasímetros.

Las solicitudes se deben efectuar con por lo menos 6 meses de antelación al comienzo. El Servicio Meteorológico Nacional posee comedor con tarifas económicas. Costos (1996): US\$ 2 800.-

Admis. Estudios secundarios completos al nivel de las escuelas técnicas industriales.

ARG-2 Comité Nacional para el Programa Hidrológico Internacional, Buenos Aires

Dirección:	Director General	TEL:	(54-1) 514-4253
	Servicio Meteorológico Nacional	FAX:	(54-1) 514-4225
	25 de Mayo 658	E-Mtx:	33 27 040 METEO AR
	1002 BUENOS AIRES, República Argentina		

ARG-2-1	Claves: HYD Operacional Cl. 1b	ProfF-Bases	7 meses	Ad hoc	Español	1998
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Título del curso: *Curso internacional de hidrología con énfasis en hidrología subterránea*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Su objetivo es la iniciación profesional en hidrología de los graduados en carreras universitarias técnicas afines (ingenierías, meteorología, geología, geomorfología, geografía, etc.). Comienza con un período de nivelación con temas básicos elementales, luego analiza exhaustivamente la Hidrología Superficial y, finalmente también analiza en forma exhaustiva la Hidrología Subterránea, cuidando de hacer resaltar los nexos que hacen que estos dos enfoques no sean independientes. Además, a lo largo de todo el dictado de las clases se tomará en cuenta la conservación del medio ambiente y el análisis del impacto ambiental de las obras con base hidrológica. Se expiden diplomas a los estudiantes que hayan cumplido con los requisitos académicos fijados para su promoción.

Admis.

**ARG-3 Centro Regional de Formación Profesional, UBA,
Buenos Aires**

Dirección: Facultad de Ciencias Exactas y Naturales de la
Universidad de Buenos Aires
Departamento de Ciencias de la Atmósfera
Ciudad Universitaria Pabellón II
1428 BUENOS AIRES, República Argentina

TEL: (54-1) 576-3356, ext 17

FAX: (54-1) 576-3364

E-Mtlx: secret@at.fcen.uba.ar

ARG-3-1 Claves: MET Científica Cl. 1a UnivF-I&D 5 años Anual Español 1998

Título del curso: *Licenciatura en ciencias de la atmósfera*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

El curso comprende el Ciclo Básico Común de la Universidad de Buenos Aires, 24 materias y una tesis de licenciatura. CICLO BÁSICO COMÚN: Análisis, álgebra, física, química, introducción al conocimiento de la Sociedad y el Estado, introducción al conocimiento científico. MATERIAS OBLIGATORIAS: Ciclo de Formación Básica: Matemática 1, Matemática 2, Matemática 3, Matemática 4, Cálculo numérico, Probabilidades y Estadística, Física, 1, Laboratorio 1, Física 2, Laboratorio 2, Física 3.

CICLO DE FORMACIÓN INTRODUCTORIA: Meteorología General; Meteorología Técnica, Meteorología Sinóptica, Dinámica de la Atmósfera 1, Climatología, Convección y Microfísica de Nubes.

MATERIAS OPTATIVAS: Mecánica de los fluidos, Circulación General de la Atmósfera, Métodos Numéricos en las Ciencias de la Atmósfera, Métodos Estadísticos en las Ciencias de la Atmósfera 1, Laboratorio de Previsión del Tiempo, Meteorología Tropical, Pronóstico Numérico, Dinámica de la Atmósfera 2, Climatología Dinámica, Climatología Local, Turbulencia y Capa Límite Atmosférica, Mecánica Clásica, Química General e Inorgánica 1, Química de la Atmósfera, Hidrología, Hidrometeorología, Contaminación Atmosférica, Micrometeorología, Meteorología Agrícola 1, Meteorología Agrícola 2, Métodos Estadísticos en las Ciencias de la Atmósfera 2, Mesometeorología, y otras materias que se considere conveniente.

El plan de estudios está compuesto por un ciclo de formación básica (11 materias obligatorias), un ciclo de formación introductoria (6 materias obligatorias) , un ciclo de especialización (subdividido en un ciclo de especialización inicial y un ciclo de materias optativas) y 1 tesis de licenciatura. El ciclo de especialización está compuesto por 5 materias de especialización inicial y 2 materias optativas acordes con una determinada orientación, seleccionadas en coincidencia con una comisión de estudios. La inscripción se realiza en octubre de cada año. En relación a las condiciones de admisión, cualquier situación particular no contemplada expresamente, será analizada por una Comisión Especial. La duración de las materias es cuatrimestral. No se paga matrícula.

Admis. Estudios secundarios completos. Curso de estudios superiores. Extranjeros pueden cursar materias y obtener certificados.

ARG-3-2 Claves: MET AyudPronósti Cl. 2 ProfE-Bases 3 años Anual Español 1998

Título del curso: *Bachillerato Universitario en Ciencias de la Atmósfera*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

El curso comprende el Ciclo Básico Común de la Universidad de Buenos Aires y 15 ó 16 materias. Presenta cuatro orientaciones: Meteorología Sinóptica, Climatología, Meteorología Agrícola e Hidrometeorología.

CICLO BÁSICO COMÚN: Análisis, Álgebra, Física, Química, Introducción al conocimiento de la sociedad y el estado, Introducción al conocimiento científico. MATERIAS COMUNES OBLIGATORIAS: Ciclo de formación Básica e introductoria: Matemática 1, Matemática 2, Matemática 3, Probabilidades y estadística 1, Física 1, Meteorología general, Física de la atmósfera, Seminario de computación (1), Introducción a la dinámica de la atmósfera (2), Climatología, Meteorología sinóptica 1(2), Observación de la atmósfera.

MATERIAS DE ORIENTACIÓN: A-METEOROLOGÍA SINÓPTICA: Laboratorio sinóptico, Complementos de meteorología sinóptica, Entrenamiento en Meteorología Sinóptica. B-CLIMATOLOGÍA: Laboratorio climatológico, Microclimatología (2), Complementos de Climatología (2), Entrenamiento en Climatología. C-METEOROLOGÍA AGRÍCOLA: Botánica Agrícola (2), Microclimatología, Agrometeorología, Entrenamiento en meteorología agrícola. D-HIDROMETEOROLOGÍA: Laboratorio Climatológico, Hidrología, Entrenamiento en hidrología.

El plan de estudios está compuesto por un ciclo de formación Básica e introductoria con materias de orientación (2 o 3 materias) y un entrenamiento en la orientación. Es una carrera intermedia y la mayor parte de la materias comunes coincide con las de los ciclos de formación Básica y de formación introductoria de la Licenciatura en ciencias de la atmósfera. La inscripción se realiza en octubre de cada

año. En relación a las condiciones de admisión cualquier situación particular no contemplada expresamente será analizada por una Comisión Especial. La duración de las materias es cuatrimestral con excepción de las señaladas (1) mensual (2) bimestral común con la Licenciatura en Ciencias de la Atmósfera. No se paga matrícula.

Admis. Estudios secundarios completos. Cursos de estudios superiores. Extranjeros pueden cursar materias y obtener certificados.

ARG-3-3 Claves: GEO Científica Cl. 1a UnivF-I&D 5 años Anual Español 1998

Título del curso: *Licenciatura en Oceanografía*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

El curso comprende el Ciclo Básico Común de la Universidad de Buenos Aires, 24 materias y una tesis de licenciatura. CICLO BÁSICO COMÚN : Análisis, Álgebra, Física, Química, Introducción al conocimiento de la sociedad y el estado, Introducción al conocimiento científico. MATERIAS OBLIGATORIAS: Ciclo de Formación Básica: Matemática 1, Matemática 2, Matemática 3, Matemática 4, Cálculo numérico, Probabilidades y Estadística, Física, 1, Laboratorio 1, Física 2, Laboratorio 2, Física 3, Química general. CICLO DE FORMACIÓN INTRODUCTORIA: Oceanografía General; Meteorología y Oceanografía Técnica, Dinámica de la atmósfera y el océano 1, Oceanografía física, Circulación general, Química del agua de mar.

MATERIAS OPTATIVAS: Materias de especialización: Métodos numéricos, métodos estadísticos, introducción a la ingeniería de costas, mareas, olas, oceanografía tropical, modelos numéricos, biología marina, geología marina y litoral, geofísica marina, propagación del sonido en el mar, climatología, climatología dinámica, contaminación, mecánica de los fluidos, dinámica de la atmósfera y el océano 2

El plan de estudios está compuesto por un ciclo de formación Básica (12 materias) , un ciclo de formación introductoria (6 materias obligatorias), un ciclo de especialización (6 materias) y una tesis de licenciatura. En el ciclo de formación Básica el estudiante adquiere los conocimientos y herramientas básicos de Matemática, Física y Química. Está compuesto por 12 materias obligatorias. El ciclo de especialización está compuesto por 4 materias de especialización inicial y 2 materias optativas acordes con una determinada orientación seleccionadas en coincidencia con una comisión de estudios. La inscripción se realiza en octubre de cada año. En relación a las condiciones de admisión, cualquier situación particular no contemplada expresamente, será analizada por una Comisión Especial. No se paga matrícula.

Admis.

ARG-3-4 Claves: MET Científica Cl. 1c UnivS-Atmos 5 años Semestral Español 1998

Título del curso: *Doctor de la Universidad de Buenos Aires (Área: Ciencias de la atmósfera)*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

El curso comprende la aprobación de un plan de estudios (20 puntos) de 4 a 6 materias, elaborado por el doctorando junto con un consejero de estudios. La aprobación de una tesis de investigación original realizada con la supervisión de un Director de tesis.

La inscripción puede realizarse en toda época del año. Se abonan u\$s 100 en concepto de matrícula

Admis. Carrera abierta a egresados de la Licenciatura en ciencias de la atmósfera y a otros egresados (p.ej.: físicos, oceanógrafos, ingenieros, agrónomos, etc.) quienes deberán cursar materias de nivelación. Requiere la aprobación de un examen de admisión.

ARG-3-5 Claves: MET Clhymet Cl. 1c UnivS-Agric 2 años Ad hoc Español 1998

Título del curso: *Magister de la Universidad de Buenos Aires. (Orientación: Meteorología Agrícola)*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

El Programa de Estudios está compuesto por un grupo de Materias de Nivelación acreditadas o cursadas por el maestrando; un grupo de Materias Obligatorias y Optativas, cursadas bajo la supervisión de un Consejero de Estudios y un Trabajo de Tesis. El grupo de Materias de Nivelación está destinado a completar la formación de profesionales provenientes de distintas áreas; capacitándolos para la realización conjunta de las actividades restantes. La Comisión de Maestría determinará, de acuerdo con los antecedentes de cada aspirante, los cursos de nivelación que deberá cumplir. El Grupo de Materias Obligatorias y Optativas tiene por finalidad brindar los conocimientos correspondientes a los distintos campos de acción de la Meteorología Agrícola. Ocho de las mismas (con un total de 30 créditos) son obligatorias y las restantes (15 créditos) serán propuestas por el maestrando, de acuerdo con su Consejero de Estudios, entre las ofrecidas en esta Maestría o entre otros programas de esta Universidad. La Tesis de

Maestría (30 créditos) consiste en un trabajo de investigación o desarrollo tecnológico con la guía de un Director de Tesis.

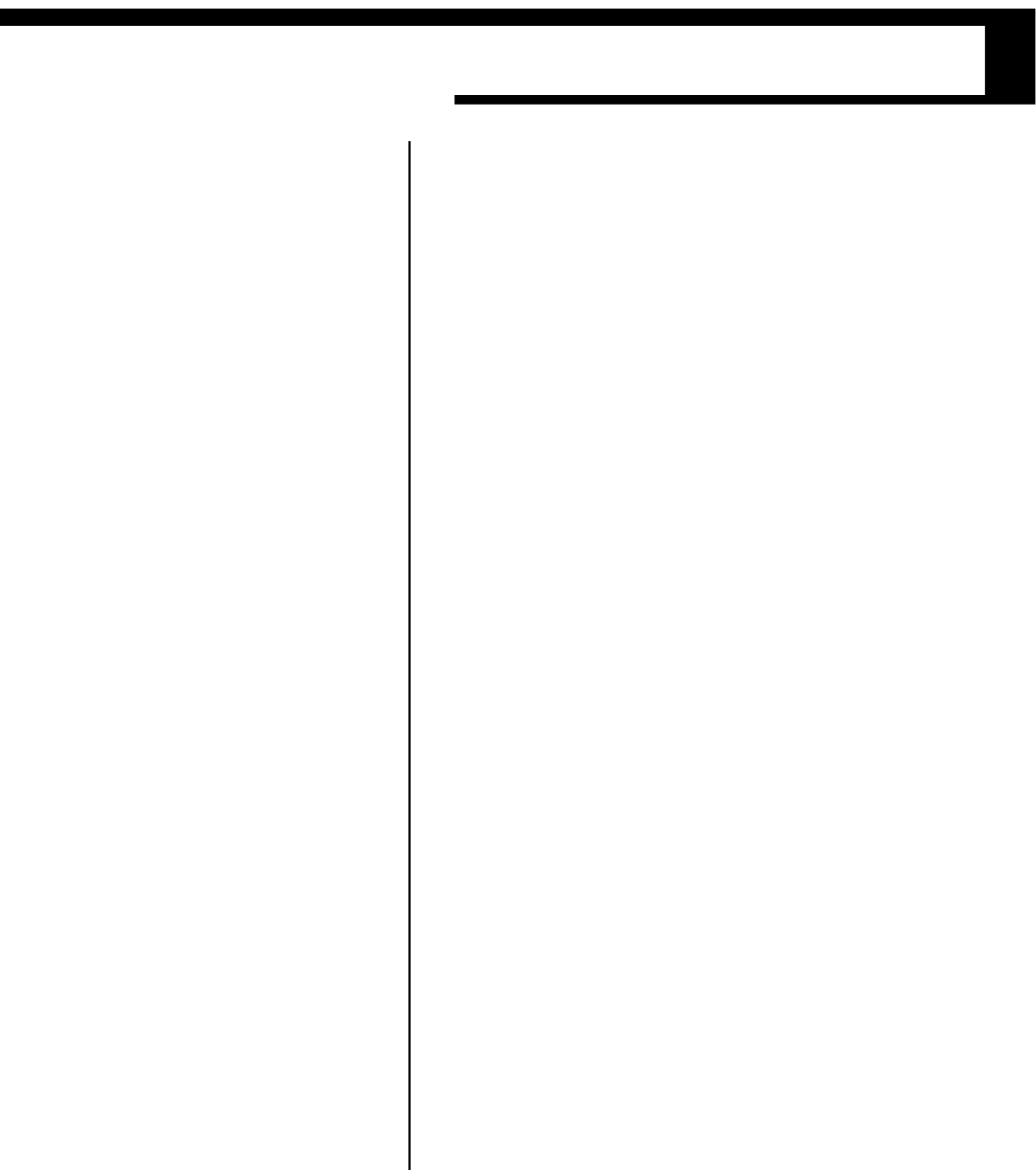
MATERIAS DE NIVELACIÓN: Para graduados en Ciencias Agrarias: Matemática 1, Matemática 2, Matemática 3, Física General, Meteorología General, Meteorología Teórica, Meteorología Sinóptica. Para graduados en Ciencias de la Atmósfera: Química General, Química Biológica, Anatomía, Fisiología Vegetal, Anatomía y Fisiología Animal, Introducción a las Ciencias Agrarias, Edafología, Ecología.

MATERIAS OBLIGATORIAS: Meteorología Agrícola, Informática, Observaciones Biológicas y Atmosféricas, Climatología, Estadística, Micrometeorología, Laboratorio de Diseño Experimental, Hidrología, Economía Agraria y Meteorología.

MATERIAS OPTATIVAS: Biometeorología, Fisiología Animal Ambiental, Modelos Agrometeorológicos, Factores adversos para la Agricultura y Adaptación de las Plantas al Stress Ambiental, Climatología Aplicada, Micrometeorología Aplicada y otras materias que se considere conveniente incluir.

La Maestría en Meteorología Agrícola es una carrera de la Universidad de Buenos Aires en la que participan las Facultades de Ciencias Exactas y Naturales y de Agronomía. La Sede Administrativa es el Departamento de Ciencias de la Atmósfera de la Facultad de Ciencias Exactas y Naturales, Centro Regional de Formación Profesional Buenos Aires de la Organización Meteorológica Mundial. En caso de poder efectuar cursos de Nivelación en su Universidad local, los aspirantes podrán remitir a consideración de la Comisión de Maestría la documentación relacionada con las materias que propongan como equivalentes (programa, cargo horaria, evaluación, docentes) a fin de que ésta dictamine sobre su validez. Inscripción: Remitir los antecedentes al Departamento de Ciencias de la Atmósfera - Comisión de Maestría de acuerdo a la planilla de inscripción diseñada para tal fin. Aranceles : Aproximadamente US\$ 1.500 por el total de materias obligatorias y optativas y la Tesis. A ello debiera agregarse los aranceles correspondientes a las Materias de Nivelación que deba cursar el maestrando (aproximadamente US\$ 20 por cada 16 horas de clase). Ayuda Económica: La Universidad de Buenos Aires preve brindar ayuda a cierto número de estudiantes, de acuerdo con modalidades que se comunicarán oportunamente a quienes lo requieran. Medios e Instalaciones: Radar Meteorológico en el Aeropuerto Internacional de Ezeiza; Teletipo y Receptor para información meteorológica; Sistema de procesamiento de imágenes; Torre micrometeorológica; Cámara de video-filmación; Equipo de reproducción de videos; Lectora-impresora de microfichas y microfilms; Oficinas, laboratorios, sala de computadoras, dependencias administrativas, etc.

Admis. Profesionales graduados en Ciencias de la Atmósfera. Ciencias Agropecuarias y sus afines, según antecedentes, quedará a consideración de la Comisión de Maestría.



BRAZIL, The Federative Republic of

Última actualización: 24-May-98

BRA-1 Federal University of Rio de Janeiro

Dirección: Universidade Federal do Rio de Janeiro
Instituto de Geociências - CCMN
Departamento de Meteorologia
21 949 RIO DE JANEIRO, RJ - Brasil

TEL: (55-21) 280-0333
FAX: (55-21) 590-3200
E-Mail: 21 37 466

BRA-1-1 Claves: MET Científica Cl. 1a UnivF-Super 4 años Anual Portugués 1995

Título del curso: *B.Sc. in Meteorology*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

BASIC SCIENCES: Mathematics, physics and computer applications are taught during the first year and a half to ensure that the candidate has the level required to commence his meteorological studies.

METEOROLOGY TRAINING includes: dynamic meteorology; physical meteorology; synoptic meteorology; meteorological statistics; hydrometeorology; climatology; agrometeorology; meteorological instruments, solar radiation, air pollution, tropical weather meteorology, numerical prediction, micrometeorology, remote sensing, environmental studies.

Requests for admission should be submitted through the Ministry of Foreign Affairs in the interested countries. The candidate from countries are admitted without the entrance examination. There is no fee and no tuition. The admissions must be sent to the university on January and the academic year starts on March of each year. Student house and scholarship are available. Numerous career opportunities exist in Federal and state education. Many of our students continue their education by seeking the M.Sc. and Ph.D degree in atmospheric science.

Admis. Requirements: High School level. Entrance examination.

BRA-2 Departamento Nacional de Aguas e Energia Elétrica, Brasília

Dirección: Departamento Nacional de Aguas e Energia Elétrica
Sgan 603, Bloco J, 1º andar
70.830-030 - BRASILIA, DF- Brazil

TEL: (55-61) 321-3436
FAX: (55-61) 224-4190
E-Mail: dnaee@cr_df.mp.br

BRA-2-1 Claves: HYD Operacional Cl. 2 ProfS-Repas 2/4 años Bienal Portugués 1995

Título del curso: *Técnicas de Medição de Vazão em Grandes Rios*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

PART 1. Theoretical: two days in Manaus (Amazon State Capital); Introduction to topography, Equipment for operation, Flow measurement methods for large rivers, Exercises with programmes for hydrometric computation.

PART 2. Practical: six days in Manacapuru (Amazon State). Flow measurement methods: "Anchored Boat", "Moving Boat" and "Large Rivers" at the Manacapuru station, Solimões river, 80km from Manaus.

PART 3. Working groups: The students are divided into groups. Each group is asked to carry out a complete measurement process, using all theoretical background discussed in class, and present final report. Each student is supposed to execute the complete measurement process of lease one of the methods introduced.

Starting date: Between April and October (according to weather conditions) The course is held in Manaus, and practical part in Manacapuru, that is located 80km from Manaus at the Solimões river. It is also suitable College level technicians from institutions responsible for hydrometric network operation.

Application may be solicited from January to March in the year of the course. Participation fee is US\$ 1,500.00 which includes tuition, transportation from Manaus to Manacapuru.

Admis. Hydrological engineer or professional that works on operational hydrology, on hydrometric data analysis and also familiar with hydrometeorological data processing.

BRA-3 IPE, Office of Post Graduation in Meteorology, Sao Paulo

Dirección: Instituto de Pesquisas Espaciais
Caixa postal 515, São José dos Campos
SAO PAULO, Brazil

TEL: (55-12) 325-6845
FAX: (55-12) 325-6666
E-Mail: pgmet@p_grad.met.inpe.br

BRA-3-1 Claves: MET Científica Cl. 1c ProfS-Inves 3-5 años Anual Portugués 1995

Título del curso: *Treinamento de Meteorologistas; Meteorologist Training - M.Sc. , Ph.D. levels*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Basic mathematics; general meteorology; introduction to the atmospheric dynamics; meteorological thermodynamics and statistics; classical mechanics; fluid mechanics; mathematical methods of physics; dynamic meteorology; synoptic meteorology and meteorological analysis; physical meteorology; dynamic climatology; physical climatology; tropical meteorology; micrometeorology; hydrodynamic instability; atmospheric and ocean waves; cloud physics; atmospheric modelling; planetary boundary layer; general circulation of the atmosphere; planetary fluid dynamics; physics of atmospheric radiation; numerical weather prediction; physical and dynamical oceanography; satellite meteorology; numerical analysis.

There are sponsorships. There are no: student accommodation, tuition and other fees. The starting dates for inscription (courses) are: August to November.

Admis. M.Sc. programme: a B.Sc. degree in meteorology or physics, mathematics of engineering. Ph.D. programme a M.Sc. degree in meteorology or in physics, mathematics or engineering.

BRA-4 IPH, Porto Alegre

Dirección: Instituto de Pesquisas Hidráulicas (IPH)
Av. Bento Gonçalves 9500
Caixa Postal 15029
91501-970 PORTO ALEGRE, RS, Brasil

TEL: (55-51) 339-1355
FAX: (55-51) 339-6670
E-Mail: poshidr@if.ufrgs.br

BRA-4-1 Claves: HYD Científica Cl. 1c UnivS-Espec 2-3 años Anual Portugués 1995

Título del curso: *Post-Graduation Program in Water Resources and Sanitation.*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

PART 1. Credits-Main subjects: Hydrology, Hydromechanics, Water Quality, Statistics, Water Resources Planning, Hydrogeology, Remote Sensing, Drainage and Irrigation.

PART 2. Research-Development of a research Program in one of the following areas: Hydrology, Hydrogeology, Erosion and sedimentation, Irrigation and drainage, Environment, Remote Sensing, Water Resources Planning.

Starting Date: March. The course is held in Porto Alegre and research can be carried out in the institute or outside. Applications may be solicited up to December every year. Tuition fees: free.

Admis. Bachelor degree.

BRA-5 Diretoria de Hidrografia e Navegação, Niterói

Dirección: Diretoria de Hidrografia e Navegação
Rua Barão de Jaceguai, s/n°
Ponta da Armação
24.048-900 NITERÓI, Brazil

TEL: (55-21) 719-2626
FAX: (55-21) 719-7921
E-Mail: (55 21) 34 043

BRA-5-1 Claves: MET AyudPronósti Cl. 2-3 ProfS-Marin 24 semanas Anual Portugués 1995

Título del curso: *Curso de Subespecialización en Meteorología.*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Termodinámica de la atmósfera, Circulación general de la atmósfera, Instrumentos, Métodos de observación, Sistemas de informaciones meteorológicas, Meteorología física, Meteorología sinóptica, Meteorología dinámica, Climatología, Meteorología tropical, Meteorología por satélite, Oceanografía, Telecomunicaciones meteorológicas, Mesometeorología, Meteorología aeronáutica, Proceso de datos, Laboratorio sinóptico.

El curso es destinado a militares de la Marina de Brasil, del nivel medio, y su objetivo a Subespecialización en Meteorología con la finalidad de prestar el servicio meteorológico marino, bases aeronavales y los navíos que operan con aeronaves. El curso acepta alumnos de Marinas extranjeras.

Admis. Formación secundaria completa.

BRA-6 Eletrobrás, Rio de Janeiro

Dirección: Eletrobrás-Centrais Elétricas Brasileiras S/A
Divisão de Apoio a Instituições de Ensino
20090-000 RIO DE JANEIRO
RJ, Brasil

TEL: (55-21) 211-5792

FAX: ()

E-Mail: ()

BRA-6-1 Claves: HYD Operacional Cl. 2 ProfF-Repas 8 días Anual Português,S 1995

Título del curso: *Hydrosedimentology for Reservoirs*.

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

PART 1. Theoretical; 5 days: Erosion: concepts and measurements; Transport of sediments: concepts and measurements; sedimentometric network; stations and equipment; sample methods, laboratory analyses; sediment discharge computations; data processing; Reservoir sedimentation: concepts; sedimentology of hydrographic basin; computation methods to predict the sedimentation; direct measurements of reservoir sedimentation; sediment control; downstream effects;

PART 2. Practical; 3 days: Sediment samples in a river station (1 day); Laboratory practice in analyses of sediment (1 day); Computation of sediment discharge and data processing by computer (1 day).

PART 3. Working Groups: Computation of a reservoir sedimentation (this part can be given as homework after the course).

Technical course can be held in a city or country (Portuguese or Spanish Languages) by a teacher; and, it is necessary that the interested entity have equipment for the field and laboratory practice.

Admis. Hydrological engineers or professionals that work on operational hydrology and also on water resources.

BRA-7 Universidade Federal do Pará

Dirección: Universidade Federal do Pará
Departamento de Meteorologia
Caixa postal, 1611
66075 -900 - BELÉM-PARÁ , Brazil

TEL: (55-91) 211-1412

FAX: (55-91) 229-9677

E-Mail: 00 55 (091) 10 13

BRA-7-1 Claves: MET Operacional Cl. 1a UnivE-E-F&I 4 años Anual Português 1995

Título del curso: *Bachelors Degree in Meteorology (B.Sc.)*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Basic physics; basic mathematics; probability and statistics; elements of meteorology; elements of astronomy and geodesy; general climatology; meteorological instrumentation and methods of observation; applied thermodynamics, fluid dynamics; agrometeorology; applied climatology; physical meteorology; oceanography; hydrometeorology; radiation in the atmosphere; cloud physics; synoptic meteorology; dynamics meteorology; satellite meteorology; environmental meteorology; applied meteorology; current weather forecasting; tropical meteorology.

No tuition or fees are charged from the enrolled students. The Federal University of Pará does not have student housing, but provides help in housing rental, to foreign students. Foreign students must have proficiency in Portuguese and source of support for their personal expenses in Belém.

Admis. Candidates must present high school diplomas and be in good health. Brazilian students must pass entrance exams. Foreign students, from countries which have official exchange educational programs with Brazil, may be exempted from the entrance exams, by indication of their Permanent Representative with WMO.

BRA-8 University of Sao Paulo

Dirección: Institute of Astronomy and Geophysics
Department of Atmospheric Sciences - ACA
RUA DO MATÃO, 1226 - Cidade Universitaria
05508-900 - SAO PAULO - SP, Brasil

TEL: (55-11) 818-4713

FAX: (55-11) 818-4714

E-Mail: 11 56 735 IAGM BR

BRA-8-1 Claves: MET Científica Cl. 1c UnivE-E-F&I 4 años Semestral Português 1995

Título del curso: *Graduate (B.Sc.), Master (M.Sc.) Doctor (Ph.D.) in Meteorology*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

B.Sc. PROGRAMME: Integral and differential calculus; basic physics; linear algebra; mathematical methods of the physical sciences; computer programming; basic statistics; numerical methods; meteorological instrumentation and observations, fluid mechanics; dynamic meteorology; atmospheric thermodynamics; radiation; cloud physics; climatology; tropical meteorology; micrometeorology; agrometeorology; hydrometeorology; remote sensing techniques

M.Sc., Ph.D. PROGRAMMES: Advanced dynamic and synoptic meteorology; Physical meteorology; Statistical and dynamic meteorology; Atmospheric modelling; Convective dynamics; Micrometeorology; Theories of fronts; Radiometeorology.

Duration and starting dates: B.Sc. minimum 8 academic semesters; March, each year; M.Sc.. minimum 4 academic semesters; March even years; Ph.D.. minimum 6 academic semesters; March even years.

Besides regular programmes, the Department of Meteorology of the University of Sao Paulo offers, occasionally, short courses for operational personnel which already hold a B.Sc. degree. These courses have the objective of training in topics of analysis and forecasting using radar and satellite imagery, as well as diagnostic and conceptual models. No tuition fees.

Admis.

BRA-9 Universidade Federal de Viçosa

Dirección: Dr. Gilberto c. Sedyama
Dept de Engenharia Agrícola
36570-000 Viçosa - MG
Brasil

TEL: (55-31) 899-2734
FAX: (55-31) 899-2735
E-M/tix: Sedyama@BRUFV.BITNET

BRA-9-1 Claves: MoH Operacional Cl. 1c UnivF-Agric 2 años Semestral Português 1995

Título del curso: *Meteorología Agrícola (M.Sc.)*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

DISCIPLINAS - AREA DE CONCENTRAÇÃO: Evapotranspiração, Meteorologia Física, Radiação Solar,, Meteorologia Dinâmica I, Meteorologia Agrícola, Micrometeorologia, Climatologia Física, Microclimatologia, Métodos Quantitativos em Climatologia, Modelagem Agrometeorológica, Instrumentação Agrometeorológica, Movimento d'Agua no Solo, Problemas Especiais, Hidrologia, Instrumentos e Sistemas de Medições Elétricas, Seminário, Pesquisa.

DOMINIO CONEXO: Relações Agua-Planta, Simulação, Fisiologia da produção, Física do Solo, Ecofisiologia Vegetal, Fisiologia Animal, Metodologia do Ensino Superior, Bioclimatologia Animal, Sensoriamento Remoto, Manejo e Conservação de Solos, Técnicas de Redação Científica.

For additional information, write to: (Ã) Coordenação de Pós-Graduação em Meteorologia Agrícola, Departamento de Engenharia Agrícola, Universidade Federal de Viçosa, 36571-000 Viçosa - Minas Geras, Tel: (031) 899.2734. (Ão) Conselho de Pós-Graduação, Universidade Federal de Viçosa, 36571-000, Tel: (031) 899.2147 , 899.2146

Admis. Diplomas, curriculum vitae.

BRA-10 Universidade Federal de Pelotas

Dirección: Prof. José Honorato de Oliveira Filho
Universidade Federal de Pelotas
Departamento de Meteorologia
Campus universitário
96010-900- Pelotas - BRASIL

TEL: (55) 0532-757329
FAX: (55) 0532-757330
E-M/tix: honorato@ufpel.tche.br

BRA-10-1 Claves: MET Science Cl. 1a Bases 4 years Annual Português 1998

Título del curso:

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Basic Sciences: Mathematics, Physics and Computer Applications are taught during the first year and a half, to ensure that the candidate has the level required to commence his meteorological studies.

Meteorology Training includes: Dynamic Meteorology; Physical Meteorology; Synoptic Meteorology; Climatology; Hydrometeorology; Agrometeorology; Meteorological Statistics; Meteorological Instruments;



Solar Radiation; Micrometeorology; Aeronautical Meteorology; Marine Meteorology; Tropical Meteorology; Numerical Weather Prediction; Remote Sensing; Environmental Studies.

Numerous career opportunities exist in Federal State Education. Many of our students continue their education by seeking the M.Sc. and Ph.D. degree in Atmospheric Science.

Admis. High School level. Entrance Examination.



CHILE, The Republic of

CHL-1 Escuela Técnica Aeronáutica, Santiago-Chile

Dirección: Sr. Representante Permanente ante la OMM
Dirección Meteorológica de Chile
Casilla 63, Aeropuerto Arturo Merino Benítez
SANTIAGO-CHILE

TEL: (56-2) 698-5341

FAX: (56-2) 601-9590

E-Mail: dimet@reuna.cl

CHL-1-1 Claves: MET Operacional Cl. 2 ProfE-Bases 4 años Anual Español 1995

Título del curso: *Ingeniero de ejecución en Meteorología*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Administración general , Álgebra I y II, Cálculo I, II y III, Ecología, Estadística y probabilidades I y II, Física I y II, Geografía física, Inglés I, II y III, Lenguaje de programación, Metodología de investigación, Química I y II, Agrometeorología, Climatología, Computación aplicada, Instrumentos meteorológicos, Interacción océano-atmósfera. Laboratorio de meteorología, Meteorología aeronáutica, Meteorología dinámica I y II, Meteorología física I, II y III, Meteorología sinóptica I y II, Satélites meteorológicos I y II, Trabajo de investigación, Práctica en terreno.

Los cursos son programados de acuerdo a las necesidades de la Dirección Meteorológica de Chile. El costo del curso es determinado una vez fijado su inicio.

Admis. Egresado de educación media, prueba de aptitud académica y examen de selección.

CHL-1-2 Claves: MET Observación Cl. 4 ProfF-Bases 3 semestres Anual Español 1995

Título del curso: *Técnico Operador en Observaciones Meteorológicas*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Reglamentación institucional, Conocimientos aeronáuticos relacionados, Matemáticas, Física, Inglés, Estadística, Dibujo técnico, Introducción a la computación y planillas electrónicas, Ciencias de la tierra, Comunicaciones, Equipos meteorológicos de altura, Educación física, Climatología, Meteorología, Laboratorio de meteorología, Instrumentos meteorológicos, Métodos e informes de observaciones, Práctica en terreno.

Los cursos son programados de acuerdo a las necesidades de la Dirección Meteorológica de Chile. El costo del curso es determinado una vez fijado el inicio del curso.

Admis. Egresado Educación Media, prueba de aptitud académica, examen de selección.

CHL-1-3 Claves: MET InstrumEquip Cl. 4 ProfF-Instr 3 semestres Anual Español 1995

Título del curso: *Técnico Operador en Instrumentos Meteorológicos*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Meteorología general, Tecnología de taller, Instrumentos de superficie I y II, Cronometría y registro, Electrónica, Sistemas digitales, Electricidad, Laboratorio de instrumentos de superficie I y II, Instrumentos de superficie I y II, Reglamentación institucional, Física, Química, Inglés técnico, Educación física, Software de uso general, Práctica en terreno.

Los cursos son programados de acuerdo a las necesidades de la Dirección Meteorológica de Chile. El costo del curso es determinado una vez fijado el inicio del curso.

Admis. Egresado de Educación Industrial, examen de selección.

CHL-2 Universidad de Valparaíso

Dirección: Universidad de Valparaíso
Depto. de Física y Meteorología
Gran Bretaña 644
VALPARAISO, Chile

TEL: (56-2) 282-2001

FAX: (56-2) 282-2001

E-Mail: coquimbo.decom.uv.cl

CHL-2-1 Claves: MET Operacional Cl. 1a UnivF-Atmos 4 años Anual Español 1995

Título del curso: *Licenciatura en Meteorología*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Matemáticas y física (4 semestres), estadística, computación, climatología general, climatología aplicada, instrumentos, oceanografía física descriptiva, meteorología física, climatología sinóptica, hidrología, meteorología dinámica, meteorología sinóptica, aplicación de satélites meteorológicos, interacción océano-

atmósfera y filosofía de las ciencias; además, seminario de tesis y examen de grado

Admis. Egresado de enseñanza media, prueba de aptitud académica.

COL-1 Universidad Nacional de Colombia, Bogotá/Medellín

Dirección:	Instituto de Hidrología, Meteorología y Estudios Ambientales (IDEAM)	TEL:	(57-1) 286-0658
	Santa Fé de Bogotá, DC	FAX:	(57-1) 284-2402
	Colombia	E-Mail:	443.45 HIMAT CO

COL-1-1 Claves: MoH Operacional Cl. 1 ProfE-EF&I 3-6semestres Anual Español 1998

Título del curso: *Formación Profesional en Hidrología y Meteorología*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

NIVEL DE POSTGRADO:

Hidrología:

- * Especialización en Recursos Hidráulicos con énfasis en Hidrología - Universidad Nacional de Colombia, Bogotá. Duración: Año y medio ó 3 semestres académicos.
- * Especialización en Aprovechamiento de Recursos Hidráulicos - Universidad Nacional de Colombia, Medellín. Duración: 3 semestres académicos.
- * Magíster en Recursos Hidráulicos - Universidad Nacional de Colombia, Bogotá. Duración: Dos años y medio ó 4 semestres académicos.
- * Magíster en Aprovechamiento de Recursos Hidráulicos - Universidad Nacional de Colombia, Medellín. Duración: 4 semestres académicos.
- * Doctorado en Aprovechamiento de Recursos Hidráulicos - Universidad Nacional de Colombia, Medellín. Duración: 6 semestres académicos.

Meteorología:

- * Especialización en Meteorología - Universidad Nacional de Colombia, Bogotá. Duración: 3 semestres académicos.
- * Magíster en Meteorología - Universidad Nacional de Colombia, Bogotá. Duración: 4 semestres académicos.

NIVEL DE PREGRADO:

No existen en nuestro país a nivel de Pregrado las carreras universitarias de Hidrología ó Meteorología como tal, lo que se tiene actualmente son algunas carreras universitarias que le dan énfasis a la Hidrología y la Meteorología, como por ejemplo, Ingeniería en Recursos Hídricos y Gestión e Ingeniería Geográfica.

Admis. Grado universitario

COSTA RICA, The Republic of

CRI--1 **Universidad de Costa Rica**

Dirección: Escuela de Física
Universidad de Costa Rica
San Pedro de Montes de Oca
San José, Costa Rica

TEL: (506) 207-5394

FAX: (506) 224-9367

E-M/llx: vcastro@cariari.ucr.ac.cr

CRI-1-1 Claves: MET Técnico Cl. 2 Proff-Espec 18 meses Ad hoc Español 1995

Título del curso: *Formación de Técnicos : Meteorólogos Clase II*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

PRIMERAS CUATRO SEMANAS: los estudiantes llevan un curso de nivelación intensivo, el objetivo del curso es homogenizar la formación básica de los participantes al nivel de enseñanza secundaria en física y matemática e identificar problemas específicos personales y académicos de los estudiantes para su atención y toma de medidas correctivas.

POSTERIORMENTE, DOS CICLOS corresponden a una formación general introductoria en física, matemáticas y meteorología (área básica) que prepara a los estudiantes par tomar los cursos o materias específicas de su formación técnica en meteorología en los ciclos tercero y cuarto (área específica). En estos dos ciclos se ofrecen los cursos modulares del programa en meteorología y se enfatiza la formación de los estudiantes en aspectos prácticos relacionados con la dinámica, la sinóptica y la climatología de los fenómenos meteorológicos más importantes que afectan las actividades del hombre.

EL ÚLTIMO CICLO corresponde al de orientación técnica (área de orientación) y en él se introduce y familiariza al estudiante con técnicas modernas de uso común en áreas como la aeronáutica, la predicción del tiempo, la agrometeorología, la hidrometeorología y la climatología, así como con aspectos básicos técnico-administrativos en la conducción de labores operativas de un servicio meteorológico nacional. En este ciclo, el estudiante prepara con la orientación de un profesor del programa, un trabajo técnico (Trabajo Final) en algún tema de interés meteorológico que lo capacite par la confección de informes técnicos en las instituciones de origen.

El Programa de Clase II es un plan de estudios con une orientación eminentemente de tipo práctica basada en una razonable y particular formación académica en física, matemática y ciencias complementarias a la meteorología. Se considera importante capacitar a los participantes en labores de supervisión técnica de personal de observación meteorológica y en el control de la calidad y el procesamiento de información meteorológica. Este curso de formación técnica se imparte únicamente cuando se reúne un grupo de al menos 15 estudiantes.

Admis. Estudios de enseñanza secundaria y examen de admisión.

CRI-1-2 Claves: GEO Científica Cl. 1c UnivE-Super 2 años Semestral Español 1995

Título del curso: *Maestría en Ciencias de la Atmósfera (M.Sc.)*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

PRIMER AÑO: Primer semestre: Dinámica de la Atmósfera; Capa Límite Atmosférica; Circulaciones Atmosféricas; Curso optativo I*; Seminario de Ciencias de la Atmósfera I. Segundo semestre: Dinámica de Nubes y Tormentas; Química Atmosférica; Curso optativo II*; Curso optativo III*. Examen de Candidatura. SEGUNDO AÑO: Tercer semestre: Seminario de Ciencias de al Atmósfera II; Investigación Dirigida I; Investigación de Tesis I. Cuarto semestre: Investigación Dirigida II; Investigación de Tesis II; Redacción de Tesis.

* Se deben aprobar al menos ocho créditos en cursos optativos (dos o más cursos dependiendo del número de créditos del curso). Los estudiantes que ingresen al programa con un grado académico que no sea en Meteorología o Ciencias de la Atmósfera, deben llevar entre sus cursos optativos los cursos Tópicos de Física Atmosférica y Meteorología Sinóptica. Son obligatorios los siguientes cursos: Dinámica de la Atmósfera, Capa Límite Atmosférica, Circulaciones Atmosféricas, Dinámica de Nubes y Tormentas, Química Atmosférica. La lista de cursos optativos varía de acuerdo a la disponibilidad de profesores del programa. Con la aprobación de la Comisión, se pueden considerar como cursos optativos algunos cursos de otros programas de posgrado.

La Maestría se imparte a lo largo de cuatro semestres. Durante el primer y segundo semestres, los participantes llevan cinco cursos obligatorios y deben ganar doce créditos en cursos optativos. Durante el segundo y tercer semestres deben realizar dos seminarios (uno en cada semestre). Durante el segundo año el estudiante debe realizar su trabajo de tesis. Al concluir los cursos, previo dictamen favorable del Comité Asesor, el estudiante deberá someterse a las pruebas de candidatura a que se refiere el Reglamento General del Sistema de Estudios de Posgrado de la Universidad de Costa Rica.

Admis. B.Sc. en meteorología o carrera afín a la meteorología; Dictamen de la comisión de admisión.

CRI-1-3 Claves: MET Operacional Cl. 1b Unive-Espec 10-14 meses Ad hoc Español 1995

Título del curso: *Especialidad en Meteorología Aplicada*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

PRIMER SEMESTRE: Meteorología Dinámica; Meteorología Física; Instrumentos Meteorológicos; Tópicos de matemática y estadística. SEGUNDO SEMESTRE: Tópicos de Dinámica de la Atmósfera; Dinámica de Nubes y Tormentas; Meteorología Sinóptica; Climatología. TERCER SEMESTRE: Meteorología Tropical; Seminario de Meteorología Aplicada; Optativa (Hidrometeorología, Agrometeorología, Climatología Aplicada o Meteorología Sinóptica Aplicada)

El propósito es formar personal capaz de desenvolverse en aspectos aplicados relacionados con la atmósfera, de manera que pueda detectar problemas, formular y ejecutar programas y estudios, que contribuyan al desarrollo de las múltiples actividades de cada país. Durante el primer semestre, los participantes llevan los cursos necesarios para nivelar y refrescar conocimientos en Física, Matemáticas y Meteorología. Durante el segundo semestre, obtienen conocimientos en física y dinámica atmosférica, climatología. Durante el tercer semestre se introducen a la atmósfera tropical y se orientan hacia una especialidad en Agrometeorología, Hidrometeorología, Climatología o Meteorología Sinóptica, a través de una Optativa y de un Seminario de Meteorología Aplicada, el cual está orientado a la confección de un trabajo de graduación. Es requisito de la Especialidad la elaboración de una monografía, producto de una investigación con nivel medio de originalidad. La Especialidad se imparte únicamente cuando se reúne un grupo de al menos seis estudiantes. Por medio de una entrevista se establece si el estudiante debe cursar o no un ciclo de nivelación de cuatro meses.

Admis. Licenciatura en alguna carrera afín de Meteorología, tal como Física, Ingeniería, Geografía, etc..

CRI-1-4 Claves: MET Científica Cl. 1b Unive-EF&I 1 año Semestral Español 1995

Título del curso: *Licenciatura en Meteorología; Especialización en una rama de la Meteorología*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Hidrometeorología; Agrometeorología; Meteorología Sinóptica Tropical; Seminario de Meteorología I; Optativa I; Investigación Dirigida I. Dinámica de la Atmósfera Tropical; Sistemas Convectivos Atmosféricos; Seminario de Meteorología II; Optativa II; Optativa III; Investigación Dirigida II.

El plan de Licenciatura incluye como requisito de graduación, presentar una tesis de grado de acuerdo con la reglamentación vigente.

Admis. B.Sc. en Meteorología.

CRI-1-5 Claves: GEO Científica Cl. 1b Unive-EF&I 4 años Semestral Español 1995

Título del curso: *Bachillerato en Meteorología (B.Sc.).*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

BASE FÍSICO-QUÍMICA-MATEMÁTICAS; CONOCIMIENTOS en METEOROLOGÍA. Curso Integrado de Humanidades I; Actividad Artística; Actividad Deportiva I; Cálculo I; Química General 1: Lab. de Química General ; Física I; Laboratorio de Física I; Curso Integrado de Humanidades II; Actividad Deportiva II; Introducción a la Ecuac. Diferenc.; Física II; Laboratorio de Física II; Química General 2; Laboratorio de Química General 2; Laboratorio de Química General 2; Principios de Informática; Cálculo Diferencial e Integral 2; Álgebra Lineal; Física III; Laboratorio de Física 3; Seminario de Realidad Nacional I; Inglés Intensivo; Termodinámica; Cálculo Diferencial e Integral 3; Física 4; Laboratorio de Física 4; Métodos Mat. de la Física I; Dinámica de Fluidos; Instrumentación; Mecánica Teórica I; Métodos Mat. de la Física II; Física Moderna I; Métodos Mat. de la Física III; Física Estadística; Mecánica Teórica II; Física Moderna II; Dinámica de la Atmósfera; Electromagnetismo I; Física de Nubes; Dinámica de la Atmósfera I; Meteorología Sinóptica I; Instrumentos Meteorológicos; Seminario de Realidad Nacional II; Laboratorio Intermedio; Radiación y Óptica Atmosféricas; Meteorología Sinóptica II; Métodos Estadísticos de la meteorología.

A los estudiantes provenientes de otras universidades se les puede convalidar cursos que hayan aprobado, con cursos requeridos para la carrera de Meteorología.

Admis. Estudios de enseñanza secundaria.

GUATEMALA, The Republic of

GTM-1	Instituto Nacional de Sismología, Vulcanología, Meteorología e Hidrología	TEL:	(502-2) 315 944
Dirección:	Instituto Nacional de Sismología, Vulcanología Meteorología e Hidrología	FAX:	(502-2) 315 005
	7a. Avenida 14-57 Zona 13	E-Mail:	GUATEOBS-INSIVUMEH
	GUATEMALA, C.A. Guatemala		

GTM-1-1 Claves: MET Técnico Cl. 3 Proff-Bases 5 meses Bienal Español 1988

Título del curso: *Curso de Meteorólogos Clase III*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Se impartirá a los estudiantes durante tres meses capacitación en ciencias básicas de las matemáticas, física, estadística, meteorología, laboratorio de meteorología. Durante dos meses, con la ayuda de expertos se capacitará a los alumnos en las especialidades de meteorología sinóptica, agrometeorología, dividiendo el total de estudiantes en dos equipos. El Plan detallado del curso estará basado en los programas oficiales de la Organización Meteorológica Mundial.

El tipo de enseñanza esta formulado en dos partes. 1. Información general de meteorología y cursos básicos con una duración de tres meses. 2. Dirigida a una área de especialidad que puede ser meteorología sinóptica o agrometeorología, con una duración de dos meses.

Admis. Meteorólogo Clase IV con un año de experiencia en dicha área.

MEXICO; The United Mexican States

MEX--1 Centro Internacional de Adiestramiento de Aviación Civil TEL: (52-5) 550-9621
 Dirección: Dirección del Servicio Meteorológico Nacional FAX: (52-5) 271-0878
 Av. Observatorio No. 192
 Col. Observatorio, Deleg. M. Hidalgo E-M/tlx: 177.73.31 DGSM ME
 11860 MEXICO, D.F. Mexico

MEX--1-1 Claves: MET AyudPronósti Cl. 3 ProfF-Aeron 9 meses Anual Español 1988

Título del curso: *Formación profesional de asistentes de pronosticadores*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Asistente de Pronosticador Meteorológico Aeronáutico. Meteorología General II; Meteorología Aeronáutica II; Introducción a las Estadísticas; Matemáticas; Física; Oceanografía; Observaciones en Altitud; Interpretación de Mapas; Inglés II; Reglamentos Aeronáuticos; Cifrado de Informes Meteorológicos II; Observaciones Especiales; Aerodinámica; Telecomunicaciones Aeronáuticas II; Trabajo de Laboratorio Meteorológico (Análisis Meteorológico Preliminar); Principios Fundamentales de Programación.

Con seis meses de antelación, cada año, el Centro prepara una lista en la que se señalan los cursos que podrán solicitarse. Las solicitudes deben presentarse tres meses antes de la fecha de comienzo del curso. Costos (1988): 800 dólares EE,UU mensuales, cifra que sólo cubre la formación profesional.

Admis. Certificado de bachillerato o "Vocacional de Física-Matemáticas".

MEX--2 Centro Internacional de Adiestramiento de Aviación Civil TEL: 8-46-89
 Dirección: Centro Internacional de Adiestramiento de Aviación Civil FAX:
 Base Aérea Militar Num. 1
 Apartado Postal 2661 Santa Lucía Zumpango E-M/tlx:
 Edo. de México, 55640 MEXICO

MEX--2-1 Claves: MET Observación Cl. 4 ProfF-Bases 3,5 meses Anual Español 1988

Título del curso: *Formación profesional de observadores (Clase IV) de meteorología*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Ciencias de la tierra; Meteorología general I; Meteorología aeronáutica I; Inglés I; Técnicas de observación visual; Técnicas de observación instrumental; Cifrado de informes meteorológicos I; Servicios de tránsito aéreo; Navegación aérea; Operaciones aeronáuticas; Telecomunicaciones aeronáuticas I; Climatología.

Con seis meses de antelación, cada año, el Centro prepara una lista en la que se señalan los cursos que podrán solicitarse. Costos (1988): 800 dólares EE,UU mensuales, cifra que sólo cubre la formación profesional.

Admis. Certificado de bachillerato o "Vocacional de Física-Matemáticas".

MEX--2-2 Claves: MET Pronóstico Cl. 2 ProfE-Aeron 15 meses Ad hoc Español 1988

Título del curso: *Formación profesional de Pronosticadores Meteorológicos Aeronáuticos*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Climatología Física: Análisis Meteorológico; Física; Matemáticas; Meteorología Tropical; Termodinámica y Dinámica de la Atmósfera; Trabajo y predicción en laboratorio meteorológico.

Con seis meses de antelación el Centro prepara cada año una lista de los cursos que pueden solicitarse. Las solicitudes deben presentarse tres meses antes de la fecha de comienzo del curso. Costos (1988): 800 dólares EE,UU mensuales, cifra que sólo cubre la formación profesional.

Admis. Certificado de bachillerato o "Vocacional de Física-Matemáticas" y "Licencia" para asistentes pronosticadores meteorológicos. aeronáuticos.

MEX--2-3 Claves: MET Observación Cl. 4 ProfF-Aeron 3,5 meses Anual Español 1988

Título del curso: *Formación profesional de observadores (Clase IV) de meteorología aeronáutica*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Observador: Ciencias de la Tierra; Meteorología General I; Meteorología Aeronáutica I; Inglés I; Técnicas de Observación Visual; Técnicas de Observación Instrumental; Cifrado de Informes Meteorológicos I; Servicios de Tránsito Aéreo; Navegación Aérea; Operaciones Aeronáuticas; Telecomunicaciones

Aeronáutica; Climatología.

Con seis meses de antelación, cada año, el Centro prepara una lista en la que se señalan los cursos que podrán solicitarse. Costos (1988): 800 dólares EE.UU. mensuales, cifra que sólo cubre la formación profesional.

Admis. Certificado de bachillerato o "Vocacional de Física-Matemáticas".

MOZAMBIQUE, The Republic of

MOZ-1 Serviço Meteorológico de Moçambique

Dirección: Serviço Meteorológico de Moçambique
Caixa Postal, 256
MAPUTO
República Popular de Moçambique

TEL: (258) 741 061

FAX: (258) 741 150

E-Mtx: 62.59 SMMMMP

MOZ-1-1 Claves: MET Observación Cl. 3 ProfE-Bases 3 años Anual Portugués 1988

Título del curso: *Formación profesional de observadores (Clase III) de meteorología*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

FIRST YEAR: mathematics, physics, portuguese, english, chemistry, earth science, general meteorology and meteorological telecommunications.

SECOND YEAR: mathematics, physics, portuguese, english, instruments and methods of observation, general meteorology, meteorological telecommunications, climatology, codes and plotting.

THIRD YEAR: portuguese, english, synoptic meteorology, aeronautical meteorology, aerology, solar radiation. Practical training.

Students from Portuguese speaking countries can be accepted but each case will be analysed. No fees.

Admis. 9th class with passes in mathematics and physical sciences or an equivalent qualification.

MOZ-1-2 Claves: MET Observación Cl. 4 ProfF-Bases 9 meses Anual Portugués 1988

Título del curso: *Formación profesional de observadores (Clase IV) de meteorología*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

LECTURES - six months: basic mathematics and physics, Portuguese, general meteorology, meteorological telecommunications, meteorological observation and methods; meteorological instruments, collection and control of data. PRACTICE - three months.

Students from Portuguese speaking countries can be accepted but each case will be analysed. Fees (1988): 800 US dollars per month (training only).

Admis. 6th class.

PARAGUAY, The Republic of

PRY-1	Facultad Politécnica - Universidad Nacional de Asunción	TEL:	(595) 212-2139
Dirección:	Dirección Nacional de Aeronáutica Civil	FAX:	(595) 212-2139
	Dirección de Meteorología e Hidrología	E-Mtx:	
	Avda. Mcal López 1146, 40 piso		
	ASUNCIÓN, Paraguay		
PRY-1-1	Claves: MET Operacional Cl. 2	UnivF-Bases	3 años
		Anual	Español
			1995
Título del curso: <i>Técnico Superior en Meteorología</i>			
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :			
Pronóstico; Ayudante de Pronóstico; Técnico Operativo			
Admis. Bachiller (Curso secundario completo)			

PORTUGAL; The Portuguese Republic

PRT--1	Instituto Nacional de Meteorologia e Geofísica	TEL: (351-1) 848-3961
Dirección:	Instituto Nacional de Meteorologia e Geofísica Rua C Aeroporto de Lisboa 1700 LISBOA, Portugal	FAX: (351-1) 802 370
		E-Mail: 127.42 DIRMET P
PRT--1-1	Claves: MET Operacional Cl. 1b Proff-FeE 1 año Ad hoc Portugués 1988	
Título del curso: <i>Pasantía en Meteorología - Clase I</i>		
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :		
ON-THE-JOB TRAINING in: synoptic meteorology, climatology, aeronautical meteorology, agricultural meteorology, hydrometeorology, air pollution meteorology, marine meteorology, boundary layer meteorology, meteorological satellites.		
Los candidatos tendrán que hacer sus propios arreglos para alojamiento y alimentación.		
Admis. "Licenciatura" (B.Sc.) in physics.		
PRT--1-2	Claves: MET Operacional Cl. 2 ProfE-FeE 15 meses Ad hoc Portugués 1988	
Título del curso: <i>Entrenamiento de meteorólogo(s) - Clase II (OMM)</i>		
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :		
STAGE 1: about 9 months of lectures, laboratory work and supervised studies. Meteorological instruments and methods of observation; physical meteorology; dynamic meteorology; synoptic meteorology; hydrometeorology; climatology; interaction of the ocean and atmosphere.		
STAGE 2: about 6 months of on-the-job training appropriate to professional meteorologists.		
Six months courses of specialization, upon request, for personnel with general formation: synoptic meteorology, climatology, aeronautical meteorology, agricultural meteorology, hydrometeorology, air pollution meteorology, marine meteorology, meteorological instruments. Candidates should make their own arrangements for lodging and catering.		
Admis. Certificate of the completed first two years of an University course which includes mathematics and physics.		
PRT--1-3	Claves: MET Observación Cl. 3 Proff-Bases 1 año Ad hoc Portugués 1988	
Título del curso: <i>Observadores - Meteorología Clase III</i>		
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :		
STAGE 1: about 8 months of lectures and laboratory work; Earth science; general meteorology; meteorological instruments and methods of observation; climatology.		
STAGE 2: about 4 months of on-the-job training appropriate to professional meteorological assistants.		
Six months courses of specialization, upon request, for personnel with general formation: synoptic meteorology, climatology, aeronautical meteorology, agricultural meteorology, hydrometeorology, air pollution meteorology. Candidates should make their own arrangements for lodging and catering.		
Admis. High school certificate with aptitude in mathematics and physics (minimum 11 years primary and secondary schooling).		
PRT--1-4	Claves: MET Observación Cl. 4 Proff-Bases 1 año Ad hoc Portugués 1988	
Título del curso: <i>Observadores - Meteorología Clase IV</i>		
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :		
STAGE 1: about 8 months of lectures and laboratory work. Earth science; general meteorology; meteorological instruments and methods of observation; climatology.		
STAGE 2: about 4 months of on-the-job training appropriate to professional meteorological assistants.		
Six months courses of specialization, upon request, for personnel with general formation: synoptic meteorology, climatology, aeronautical meteorology, agricultural meteorology, hydrometeorology, air pollution meteorology, marine meteorology, meteorological instruments.		
Admis. Secondary school certificate (minimum of 9 years primary and secondary schooling).		

PRT-2	Faculdade de Ciências de Lisboa	TEL: (351-1) 758-3141				
Dirección:	Faculdade de Ciências de Lisboa Departamento de Física Rua da Escola Politécnica LISBOA, Portugal	FAX: (351-1) 759-7716 E-Mtx: 65869 FCU LIS				
PRT-2-1	Claves: GEO Científica	Cl. 1a-1c UnivE-EF&I	5 años	Anual	Portugués	1988
Título del curso: <i>"Licenciatura" en Ciencias Geofísicas</i>						
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :						
FIRST AND SECOND YEAR. The programme consists essentially in mathematics and physics.						
THIRD AND FOURTH YEAR. Instruction is given in the different branches of Earth Sciences: geology, geophysics, oceanography, dynamic meteorology, synoptic meteorology, theories of climate, ocean-atmosphere interaction.						
FIFTH YEAR. The Programme consists in on-the-job training.						
Postgraduate studies in the Faculty of Sciences are not established on permanent basis, however Ph.D. and M.Sc. degrees in meteorology can be oriented by Professors of the Department of Physics.						
Admis. High school certificate (minimum 12 years of primary and secondary schooling) a demand of equivalence is required.						
PRT-3	University of Lisbon.	TEL: (351-1) 608 028				
Dirección:	Geophysical Institute University of Lisbon Rua da Escola Politecnica LISBOA, Portugal	FAX: (351-1) 759-7716 E-Mtx: 65869 FCU LIS				
PRT-3-1	Claves: ENV Científica	Cl. 1c UnivS-I&D	2-5 años	Anual	Portugués	1988
Título del curso: <i>"Mestrado" (M.Sc.) en física del medio ambiente y "Doutorado" (Ph.D.) en meteorología</i>						
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :						
M.Sc. Programme: physical meteorology (solar and terrestrial radiation, physics of the atmosphere, cloud physics and precipitation); thermodynamics of atmosphere; dynamic meteorology including numerical methods and modelling; advanced dynamics (general circulation and boundary layer); synoptic meteorology; climatology; hydrometeorology; practical work (lab., observation, etc.); master's thesis.						
Admis. M.Sc. - B.Sc. degree in physics; Ph. D. - M.Sc. degree in meteorology and, eventually, mathematics or physics.						
PRT-4	University of Aveiro	TEL: (351-1) 26511				
Dirección:	Universidade de Aveiro AVEIRO Portugal	FAX: E-Mtx: (351-1) 37373				
PRT-4-1	Claves: MET Clhymet	Cl. 1a-1b UnivE-Bases	4-5 años	Anual	Portugués	1988
Título del curso: <i>"Licenciatura" (B.Sc.) en Física</i>						
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :						
FIRST AND SECOND YEAR. The programme consists essentially in a basic course on mathematics and physics.						
THIRD AND FOURTH YEARS are dedicated to the study of disciplines relating to the physics of atmosphere and ocean: thermodynamics, dynamic meteorology, physical meteorology, climatology, oceanography, atmosphere-ocean interaction.						
FIFTE YEAR. On-the-job training, upon request of the students.						
Admis. Qualifications and/or high school certificate (minimum 12 years of primary and secondary schooling) a demand of equivalence is required.						

SPAIN, The Kingdom of

ESP-1	Instituto Nacional de Meteorología	TEL: (34-1) 581-9630
Dirección:	Instituto Nacional de Meteorología	FAX: (34-1) 581-9845
	Centro de Estudios/Sección Enseñanzas	E-Mail: 224.27 LEMMC E
	Apartado 285	
	28071 MADRID, España	
ESP-1-1	Claves: MET Operacional Cl. 1b	ProfF-Bases 8 meses Anual Español 1988
Título del curso: <i>Meteorólogos Facultativos</i>		
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :		
FASE I (3 meses de duración): se imparten materias de las áreas de Climatología, Meteorología General, Tecnología e Informática.		
FASE II (3 meses de duración): se imparten materias de las áreas de Predicción, Meteorología del Transporte, Meteorología de Recursos y Organización y Gestión.		
FASE III (2 meses de duración): se efectúan prácticas profesionales intensivas, rotando los alumnos por las distintas Unidades Técnicas del INM.		
Costos (1988) Gratuito.		
Admis. Superar unas pruebas selectivas entre Licenciados en Ciencias e Ingenieros Superiores. Las pruebas son de Meteorología (teórica y problemas), Física y Matemáticas (teoría y problemas).		
ESP-1-2	Claves: MET AyudPronósti Cl. 2	ProfF-Bases 8 meses Anual Español 1988
Título del curso: <i>Ayudantes de Meteorología</i>		
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :		
FASE I (3 meses de duración): se imparte materias de las áreas de Climatología y Aplicaciones, Meteorología General, Tecnología, Informática.		
FASE II (3 meses de duración): se imparten materias de las áreas de Predicción Operativa, Meteorología del Transporte, Meteorología de Recursos, Área de Gestión.		
FASE III (2 meses de duración): se efectúan prácticas profesionales intensivas, rotando los alumnos por las distintas Unidades Técnicas del INM.		
Costos (1988) Gratuito.		
Admis. Superar unas pruebas selectivas entre Diplomados en Ciencias e Ingenieros Técnicos. Las pruebas son de Meteorología, Física (Teoría y Problemas) y Geografía.		
ESP-1-3	Claves: MET Observación Cl. 3	ProfF-Bases 4 meses Anual Español 1988
Título del curso: <i>Observadores de Meteorología</i>		
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :		
Se estructura en Fase única estudiando fundamentalmente de meteorología operativa y realizando trabajos prácticos profesionales.		
Se imparten las materias siguientes: Instrumentos y Métodos de Observación, Meteorología Básica y Aplicada, Claves y Mapas, Climatología, Telecomunicaciones, Informática.		
Costos (1988) Gratuito.		
Admis. Superar unas pruebas selectivas entre Bachilleres. Las pruebas de Geografía, Física, Matemáticas y Meteorología.		
ESP-1-4	Claves: MET Técnico Cl. 2	ProfF-Intnl 10 meses Anual Español 1988
Título del curso: <i>Curso Internacional de Meteorología</i>		
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :		
FASE I (4 meses de duración): se imparten materias de Meteorología Fundamental (Dinámica, Termodinámica, Física y Sinóptica) y Meteorología Operativa (Claves y Mapas, Instrumentos y Métodos de Observación y Climatología).		
FASE II (9 meses de duración): se imparten materias de Meteorología Aplicada (Aeronáutica, Marítima, Hidrología, Agrícola y Ambiental).		
FASE III (2 meses de duración): se realizan prácticas intensivas rotando los alumnos por las diferentes unidades técnicas.		

Costos (1988) Gratuito.

Admis. Ser presentado por un Director de Servicio Hispanoamericano y tener 3 años de estudios de ciencias o Ingeniería.

ESP-2	Centro de Estudios y Experimentación de Obras Públicas	TEL: (34-1) 239-2604
Dirección: CEDEX		FAX: (34-1) 228-0354
C/Alfonso XII, 3		E-M/tlx: 45022 - E
28014 MADRID, España		

ESP-2-1 Claves: HYD Clhymet Cl. 1b Proff-Intnl 6 meses Anual Español 1988

Título del curso: *Curso Internacional sobre Hidrología General y Aplicada*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

MATERIAS BÁSICAS: Climatología. Geología Hidrológica. Hidrología Agrícola. Hidrología Aplicada. Hidrología Forestal. Hidrología General. Hidrología Subterránea. Hidrología Urbanística. Meteorología. Planificación Hidrológica.

MATERIAS COMPLEMENTARIAS: Cartografía, Fotogrametría y Fotointerpretación. Estadística Aplicada. Hidráulica Fluvial. Hidroquímica. Informática Aplicada. Modelos Matemáticos. Obras Hidráulicas de Regulación. Técnicas Isotópicas Aplicadas a la Hidrología.

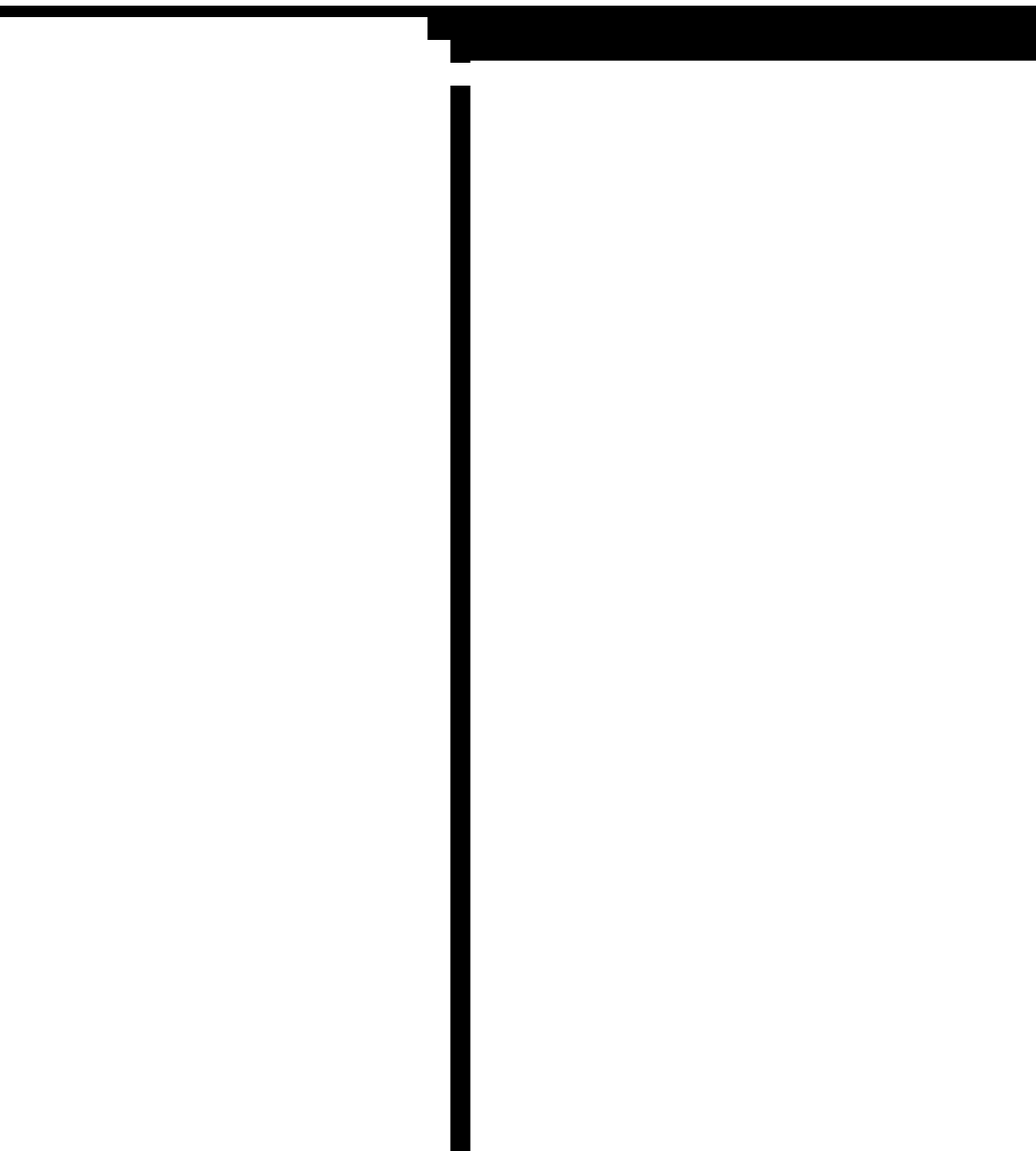
CLASES PRÁCTICAS. Seminarios específicos optativos. Conferencias. Viajes de prácticas.

Costos (1988). 2.500 Dólares USA.

Admis. Titulado superior.

URUGUAY, The Eastern Republic of

URY-1	Escuela de Meteorología del Uruguay	TEL: (598-2) 405 655					
Dirección:	Escuela de Meteorología del Uruguay	FAX: (598-2) 497 391					
	Dirección Nacional de Meteorología						
	Javier Barrios Amorín 1488, Casilla de Correo 64	E-Mtx: DINAMET 220.52 UY					
	11200 MONTEVIDEO, Uruguay						
URY-1-1	Claves: MET Observación Cl. 4	ProfF-Bases	9-12 meses	Anual	Español	1988	
Título del curso: <i>Meteorólogo Técnico Clase IV</i>							
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :							
Requiere la aprobación de las siguientes materias: Matemática I; Ciencias de la Tierra; Meteorología General; Prácticas de Observaciones Meteorológicas; Climatología I; Códigos y Símbolos; Instrumentos Meteorológicos I.							
Costos (1988) - No hay.							
Admis. Secundaria completa, además se requiere examen de nivel correspondiente de matemática.							
URY-1-2	Claves: MET Técnico Cl. 3	ProfF-Bases	9-12 meses	Anual	Español	1988	
Título del curso: <i>Meteorólogo Técnico Clase III</i>							
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :							
Requiere la aprobación de las siguientes materias: Matemáticas I; Física I; Meteorología General; Prácticas de Observaciones Meteorológicas; Climatología I; Códigos y Símbolos; Instrumentos Meteorológicos I; Laboratorio Sinóptico I; Ciencias de la Tierra.							
Costos (1988) - No hay.							
Admis. Haber completado secundaria y aprobado examen de nivel correspondiente de matemática y física.							
URY-1-3	Claves: MET AyudPronósti Cl. 2	ProfE-Bases	21-24 meses	Ad hoc	Español	1988	
Título del curso: <i>Meteorólogo Técnico Clase II con las orientaciones en Sinóptica, Climatológica e Instrumental</i>							
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :							
CURSO COMÚN para todas las orientaciones: Matemáticas II; Matemáticas III; Física II; Elementos de Cálculo de Probabilidades y Fundamentos de Estadística; Laboratorio Sinóptico II; Meteorología Sinóptica I; Meteorología Física. ORIENTACIÓN SINÓPTICA: Laboratorio Sinóptico III; Meteorología Sinóptica II; Meteorología Dinámica; Meteorología Aeronáutica y Marina. ORIENTACIÓN CLIMATOLÓGICA: Climatología II; Meteorología Sinóptica II; Agrometeorología; Hidrometeorología; Climatología Aplicada; Introducción a la Computación. ORIENTACIÓN INSTRUMENTAL: Instrumental Meteorológico II; Meteorología Sinóptica II; Laboratorio Técnico; Comunicaciones y Principios de la Electrónica.							
Frecuencia del curso: a requerimiento de las necesidades de la Dirección Nacional de Meteorología. Costos (1988) - No hay.							
Admis. Poseer diploma de Meteorólogo Técnico Clase III o equivalente en entrenamiento en Meteorología.							
URY-1-4	Claves: MET Observación Cl. 4	ProfF-Abini	2-3 semanas	Anual	Español	1988	
Título del curso: <i>Curso de Habilitación para Observadores Meteorológicos</i>							
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :							
Requiere la aprobación de las siguientes materias: Meteorología General; Instrumentos y Observaciones; Ciencias de la Tierra; Mensajes de Observaciones; Trabajos Prácticos.							
Fecha de comienzo: Variable. Se requieren arreglos previos de coordinación para determinar fecha de comienzo. Costos (1988) - No hay.							
Admis. Tener experiencia previa en Meteorología.							



VENEZUELA, The Republic of

VEN--1	Centro Interamericano de Desarrollo Integral de Aguas y Tierras (CIDIAT)	TEL: 074 442 224
Dirección: CIDIAT		FAX: 441 461
Parque la Isla		E-M/tlx: 74104 CIDIA VC
Apartado Postal 219		
MERIDA, Venezuela		
VEN-1-1	Claves: HYD Clhymet Cl. 1b ProfS-Intnl 1-18 meses Ad hoc Español 1988	
Título del curso: <i>Cursos varios sobre desarrollo de recursos hidráulicos y el uso del suelo</i>		
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :		
El programa de adiestramiento del CIDIAT está compuesto por seminarios de alto nivel, de una semana, cursos breves disciplinarios e interdisciplinarios de uno a dos meses, y cursos de postgrado de 18 meses de duración. Los cursos se dictan como actividades nacionales o interamericanas.		
En los 22 años de actividades del Centro, han pasado por las aulas del CIDIAT más de 13.755 participantes de 25 países latinoamericanos y del Caribe. La Organización de Estados Americanos (OEA), el CORDIPLAN y el Ministerio de Relaciones Exteriores de Venezuela ofrecen becas a ciudadanos y residentes de un país latinoamericano o del Caribe. La duración de los cursos: una semana; uno o dos meses; 18 meses.		
Admis. Título profesional a nivel universitario.		
VEN-2	Universidad Central de Venezuela	TEL: 6 627 753
Dirección: Universidad Central de Venezuela		FAX:
Departamento de Meteorología e Hidrología		E-M/tlx: 28319 INST VC
Facultad de Ingeniería, Escuela de Ingeniería Civil		
Ciudad Universitaria, CARACAS 1051, Venezuela		
VEN-2-1	Claves: HYD Operacional Cl. 1b ProfS-Actua 5 semanas Anual Español 1988	
Título del curso: <i>Hidrología Operativa</i>		
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :		
CONTENIDO: Medición y caudales en canales naturales. Instrumentación hidrométrica. La relación nivel-caudal. Cálculo de escurrimiento. Técnicas de campo, laboratorio y oficina para el cálculo de sedimentos fluviales. Operación de redes hidrometeorológicas.		
OBJETIVOS: Al finalizar el curso el participante estará en capacidad de realizar coordinar y supervisar programas de producción de información hidrometeorológica básica a partir de mediciones y reconocimientos de campo. Régimen: participación evaluada con opción a diploma de aprobación o sin evaluaciones con diploma de asistencia de acuerdo a selección en el momento de la inscripción. Costos (1988) Bs. 7.500,00.		
Admis. Dirigido a Ingenieros o profesionales afines, egresados de una Universidad o Instituto de nivel superior.		
VEN-2-2	Claves: MoH Operacional Cl. 4 ProfF-Bases 4 semanas Anual Español 1988	
Título del curso: <i>Auxiliar de Meteorología e Hidrología</i>		
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :		
CONTENIDO: El ciclo hidrológico. Introducción a la meteorología e hidrología. Tipos de estaciones hidrometeorológicas. Instrumental de las estaciones. Observación y mediciones de los principales elementos meteorológicos. Principales métodos de aforos.		
OBJETIVOS: Al finalizar el curso el estudiante estará en capacidad de hacer observaciones y mediciones de los principales elementos meteorológicos e hidrológicos. Costos (1988) Bs. 5.000,00.		
Admis. Personas con tercer año de educación secundaria.		
VEN-2-3	Claves: HYD Técnico Cl. 2 ProfF-Bases 4 semanas Anual Español 1988	
Título del curso: <i>Hidrología Operativa para Técnicos Medios</i>		
Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :		
CONTENIDO: Levantamientos topográficos planimétricos y altimétricos. Nivelación. Medición del caudal		

en canales naturales. Factores que afectan la precisión de las mediciones. Instrumentación hidrométrica. Relación nivel-caudal. Técnicas de campo, laboratorio y oficina para el cálculo de sedimentos fluviales. Fundamentos de operación de redes hidrometeorológicas. Procesamiento de datos hidrometeorológicos. Distribución e influencia de los elementos climáticos.

OBJETIVOS: Al finalizar el curso los participantes estarán en capacidad de desempeñarse como asistentes del personal profesional en la supervisión y coordinación de grupos de trabajos dedicados a la producción de información hidrometeorológica en Organismos que operan redes de estaciones. Costos (1988) Bs. 5.000,00.

Admis. Dirigido a personas con curso básico de observador Hidrometeorológico o similar, con experiencia de cuatro años en un Organismo público o privado.

VEN-2-4 Claves: MET Operacional Cl. 2 ProfS-Aeron 2 semanas Anual Español 1988

Título del curso: *Meteorología Aplicada a la Aeronáutica*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Introducción. La atmósfera. Presión, temperatura, densidad del aire. Aplicaciones en la aviación. Humedad. Estabilidad del aire. El viento. Turbulencia. Nubosidad. Englamiento. Visibilidad y niebla. Introducción a la Meteorología Sinóptica. Introducción a la Meteorología Tropical. Códigos meteorológicos. Servicios meteorológicos para la aviación. Organización. Uso de la información meteorológica.

El curso está dirigido a los pilotos privados y/o comerciales. Se hace énfasis en la meteorología tropical aunque se exploran, desde el punto de vista del aviador, los fenómenos meteorológicos de otras latitudes y los conceptos básicos. Información ulterior podrá obtenerse también en: Instituto Tecnológico, Ciudad Universitaria, Apartado Postal 50656, Caracas, Venezuela. Costos (1988) Bs. 4.000,00. (Está sujeto a posibles cambios según previsión cada año).

Admis. Piloto Privado o Comercial y a bachilleres que aspiran hacerse pilotos de aviones.

VEN-2-5 Claves: MET Clhymet Cl. 1b ProfS-Agric 2 semanas Anual Español 1988

Título del curso: *Meteorología Agrícola*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

CONTENIDO: Conceptos sobre Ecología Agrícola. Ecosistemas y su influencia en la producción agrícola. La red de estaciones agrometeorológicas. Mediciones y cómputos de elementos físicos y biológicos. Visita a una Estación. Fenología de cultivos. Análisis de rendimientos. La evapotranspiración real y potencial. El balance hídrico. Coeficientes de cultivos. Enfoque agroclimático de un área piloto. Duración del periodo de crecimiento. Zonificación agroclimática de cultivos. Modelos agroclimáticos: conceptos, objetivos, importancia. Areas potenciales susceptibles a la roya del café (Memileia astatrix).

OBJETIVOS específicos: Enseñar algunos de los métodos más adecuados para hacer un mejor uso de la información agroclimática en la agricultura. Señalar y discutir las técnicas clásicas y modernas en este campo de la investigación y su potencialidad para lograr una agricultura más eficiente y un mejor uso de la tierra. Costos (1988) Bs. 3.600,00.

Admis. Graduados universitarios que estén vinculados a las actividades agropecuarias o afines.

VEN-2-6 Claves: MET Operacional Cl. 1b ProfS-Clima 8 días Anual Español 1988

Título del curso: *Curso básico de diagnóstico climatológico*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Definiciones, fundamentos y metodologías usadas en climatología. Satélites meteorológicos y estudios climatológicos de OLR, SST, SLP. Radiaciones solar y atmosféricas UV, VI, IR. Las ecuaciones del movimiento medio y los transportes turbulentos. Circulaciones atmosféricas tropicales, extratropicales, MACRO, MESO, MICRO. Vientos locales. Circulaciones E-W y teleconexiones. Regímenes generales de precipitación y temperatura. Análisis del "Climatic Diagnostic Bulletin". Tiempo y Clima en la región tropical de América del Sur. Estudios de grandes cuencas hidrográficas y océanos. Estudios de lapsos de tiempo específicos. Descripción de algunos modelos GCM. Proyecto de investigación.

Al finalizar el curso, el participante estará en capacidad de analizar y aplicar la información contenida en el "Climate Diagnostic Bulletin" publicado por el NMC en Washington. Se hace énfasis en el uso de información satelitaria y en los métodos de explicación fenomenológica usados en Climatología. Costos (1988) US \$ 138,00.

Admis El aspirante a ingresar al curso debe poseer título de Ingeniero, Meteorólogo o equivalente y conocer los aspectos sinópticos básicos de las regiones tropicales, medias y polares.

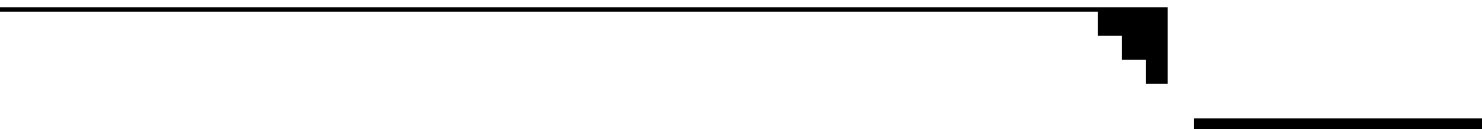
Título del curso: *Curso básico de hidrometeorología tropical*

Contenido del curso e información adicional (p.ej. objetivos, horario, instalaciones, residencia, costos, etc) :

Definiciones, fundamentos y metodologías usadas en Hidrometeorología. Termo-hidro-dinámica atmosférica. Modelos matemáticos de vientos locales. Perturbaciones tropicales intensas. Modelos estáticos de tormentas y estimación de PMP. Transposición y maximación de tormentas. Metodología del modelo ciclónico de Riehl y Byers. Descripción de modelos matemáticos dinámicos de nubes y precipitación. Conversión PMP en CMP. Estudios satelitales de patrones de lluvias.

Al finalizar el curso, el estudiante estará en capacidad de hacer estimados de PMP y CMP por métodos estadísticos y dinámicos, como también, dar explicación a las causas de lluvias y crecientes de extraordinaria magnitud en los trópicos. Costos (1988) US \$ 138,00.

Admis. El aspirante a ingresar al curso debe poseer título de Ingeniero o Meteorólogo o equivalente y conocer los aspectos básicos de las ecuaciones de movimiento y continuidad.



Base de datos-Compendio de la OMM sobre instituciones de enseñanza y formación profesional en meteorología e hidrología operativa. Ficha estándar del curso.

País:		CountryID:	ABC	Color:	XXXX
Dirección :			TEL:		
			FAX:		
	Correo E/Telex/Telegrama:				
Título del curso:					
CourseID:	ABC-1-1	Clase:		InstitutionID:	ABC-1
Área:		Actividad:		Duración:	
Idioma:		Énfasis:		Frecuencia:	
Institución docente:					
Condiciones de admisión:					
Contenido del curso :					
Información adicional:					

Se ruega comunicar la información actualizada al Programa de Enseñanza y Formación Profesional (PEFP) de la OMM. Si desea hacerlo a través de la red Internet, favor consultar la página PEPF : <http://www.wmo.ch>

Validar:

