

UNIVERSITY OF POONA

Circular No.53 of 1983-84

Subject:- Post Graduate Diploma Course in Hydrogeology

In pursuance of the decision taken by the University authorities, it is hereby notified for the information of all concerned that the Post Graduate Diploma Course in Hydrogeology shall be as given in Appendix 'A'

The teaching of the course will commence from June, 1983.

The Head of the Department of Geology is particularly requested to bring the contents of this circular to the notice of the teachers and students concerned.

Ganeshkhind, :
Pune-411007 :
No. CBS/Geology/3258-3457 :
Date: 4-3-1983 :

Sd/-A.H.Thorat
for Registrar

Copy forwarded with compliments for information and necessary action to:-

- 1) The Head of the Department of Geology
- 2) The Principals of affiliated Science Colleges.
- 3) The Deputy Registrar(Examinations)
- 4) The Asstt. Registrar(Examinations)(Co-ordination)
- 5) The Statutes Unit (E C 20 PEB/71-PA-71/83 dt. 12-2-83)
- 6) The Librarian, Jayakar Library, Pune-7
- 7) The Members, Board of Studies in Geology.

Post Graduate Diploma Course in Hydrogeology

The University of Poona will offer a Post Graduate Diploma course in Hydrogeology at the Department of Geology, University of Poona from the beginning of the academic year 1983-84. The details of the course are as follows:

1. Duration: One academic year of two semesters.
2. Pre-requisite: M.Sc. in Geology or equivalent degree from any recognised University or Institution.
3. Syllabus:

Semester I : Three theory courses

HGL 1 : Principles of Hydrogeology

HGL 2 : Groundwater Exploration

HGL 3 : Groundwater Development and

Management One practical course.

HGL 4 : Field and Laboratory techniques in hydrogeology

Each course will be of 100 marks.

Semester II : HGL 5 : A project work to be submitted

at the end of the second semester.

It will be of 200 marks

4. Evaluation:

Evaluation of courses HGL 1 to HGL 4 will be according to the system followed for M.Sc. (Semester) examination.

Evaluation of project work will be done by the internal supervisor (80 marks) and an external examiner (120 marks) to be appointed by the Departmental Committee from a panel of examiners to be prepared by the Board of Studies in Geology. The internal examiner will evaluate the day-to-day work related to the project. The external examiner will evaluate the project work.

Rules regarding passing and class will be the same as for M.Sc. (semester) examination.

HGL 1 : Principles of Hydrogeology:

Basic concepts of hydrogeology, Darcy's law, Basic equations of groundwater flow; Hydrological properties of rocks, Occurrence of groundwater, Types of aquifers, Principles of surfacewater hydrology including measurement of river flow; rainfall-run of relationship, principles of frequency analysis; Chemistry of waters including water soluble components in various rocks; hydrological inference from hydrochemical data; quality criteria for potable, agricultural and industrial waters.

HGL 2 : Exploration Techniques:

Basin as a unit for exploration studies; Hydrometeorology including types of climate, measurement of rainfall and of evaporation, computation of water balance from hydrometeorological data; remote sensing technique, geomorphological, and geobotanical techniques in groundwater; Hydrogeological surveys including well inventory and pumping tests; geophysical and geochemical studies, Bore-hole geophysics; Trace techniques, Exporation programme.

HGL 3 : Groundwater Development and Management:

Geological techniques and Hydrogeological framework of India with special reference to Maharashtra; Groundwater structures, drilling, pump-sets; Conjunctive use of surface and groundwaters, artificial recharge; Problems related to water logging, salinity and pollution; Groundwater resource potential and utilisation Space application in water resources development; Monitoring of groundwater, Mathematical modelling.

HGL 4 : Laboratory studies related to hydrometeorology, geomorphology, remote sensing, water analysis; Field studies related to well inventory, pumping tests, geophysical investigations, collection of water samples for quality and pollution studies.

HGL 5 : Project work involving field and laboratory studies of a river basin or mini-watersheds, or a group of townships/villages, and evaluation of the data with reference to occurrence of groundwater/water balance/water utilisation.

REFERENCE BOOKS

- Todd : Groundwater Hydrology
- Tolman : Groundwater Geology
- De Wiest : Geohydrology
- Lender : Aerial Photographic Interpretation: Principles and Applications.
- Heath and Trainer : Introduction to Groundwater Hydrology
- Chorley : Introduction to Physical Hydrology
- Rao : India's Water Wealth
- Charly & Dutt : Groundwater Development in India
- Hari Narayan, Raghav Rao and S. Balakrishna : Exploration Techniques for Groundwater
- Bouwer : Groundwater Hydrology
- Campbell and Lehr : Water Well technology
- Sokolov and Chapman : Methods for Water balance computation
- Davis and De Wiest : Hydrogeology
- NeFedov and Popova : Deciphering of groundwater from aerial Photographs
- Kell : Application of aerial methods in groundwater studies
- Fried : Groundwater Pollution
- Mc Whorter and Sunanda : Groundwater Hydrology & Hydraulics
- Kazmann : Modern Hydrology
- Hall and Dracup : Water Resources system Engineering
- Rodda : Facets of Hydrology
- Verruijt : Theory of Groundwater Flow
- Schoeller : And zone Hydrology-Recent Developments
- Garg : Groundwater and Tube Wells
- Ramachandra Rao : Outline of Geophysical Prospecting
- Bhattacharya and Patra : Direct Current Geoelectric Sounding
- Keller and Frischknecht : Electrical methods in geophysical prospecting
- Koefoed : Geosounding Principles

Miller : Photogeology

Chow : Handbook of Applied Hydrology

Johnson : Groundwater & Wells

Walton : Groundwater Resource Evaluation

Eckenfelder : Principles of Water quality Management

Hammaton & Sherratt : Analysis of Raw, Potable and Waster water,

Hammer : Water & Waste Water Technology

Nie & Hull : Statistical package for the social sciences

Davis : Statistics and Data Analysis in Geology

Harmon : Modern Factor Analysis
Chemical Properties of groundwater

APHA & AWWA : Standard methods for Examination of water
and waster waters.

UNIVERSITY OF PUNE

Circular No.281 of 1971-72

Pursuant to the resolutions passed by the University Authorities it is hereby notified for the information of all concerned that the curriculums for the M.Sc. (Physiology) as given in Appendix 'A' and for the M.Sc. (Human Anatomy) as given in Appendix 'B' for non-medical persons have been prescribed by the University.

Deans of Medical Colleges are requested to bring the contents of this circular to the notice of persons concerned.

Genesbkhind, POONA-7
No.F/BS/Pre-Clinic/185
Date : 27.1.1972

G.J. Abhyankar
Registrar.

Copy forwarded with compliments to :

- 1) The Dean, B.J. Medical College, Poona-1
- 2) The Commandant, Armed Forces Medical College, Poona-1
- 3) The Controller of Examinations.
- 4) Assistant Registrar (Records & Meetings Section)
- 5) Assistant Registrar (General) Statute's Committee
(E.C. (B)(22)/7-10-71) (E.C. (B)(7)/7-10-71)
- 6) Assistant Registrar (Academic)
- 7) Superintendent, Eligibility Section
- 8) Superintendent, Publication Section
- 9) Members of the Board of Studies in Pre-Clinical Studies.

APPENDIX 'A'

M.Sc. (Physiology)

M.Sc. Degree for non medical persons under
Faculty of Medicine of Poona University.

Ordinance :

The M.Sc. Degree in Medical Sciences shall be conferred by written and practical examination with dissertation in the following branches of the Medical Sciences :

Human Physiology

1. The examination for the said degree in various branches of Medical Sciences stated above shall be held twice a year.
2. The admission to the said degree course in the subject of Human Physiology shall be given to the applicant,
 - I Who has obtained the B.Sc. Degree at least in IInd Class of the Faculty of Science of Poona University or of any university equivalent to that of Poona University and has studied one of the following subjects for the B.Sc. Degree examination.
 - a) Zoology
 - b) Chemistry
 - c) Physics
 - d) Microbiology
 - e) Botany
 - Or
 - II Who has obtained the B.Sc. Degree at least in IInd Class in the subject of Nursing, Dental Sciences or Veterinary Sciences provided these degrees are recognised by the Poona University.
 - Or
 - III Who has already obtained the M.Sc. Degree in one of the branches of Medical Sciences and now desires to present himself/herself for same degree examination in another subject provided he/she fulfills all the conditions laid down for a fresh applicant.
 - IV And, who is declared acceptable for the degree course selected by the applicant, after an interview by the teacher under whom the applicant desires to pursue his/her studies.
3. Along with the application for admission to the said degree examination, the candidate shall also submit to the Registrar, the following documents certifying that,

For the category 2(I)

The candidate completed the course of studies in the period of two academic years

weivroni
of 2011
II

of three years for the period of three years of recognised post-graduate studies to pursue his/her

III. The candidate has an up-to-date record in the prescribed books maintained by him/her during the entire period of the post graduate studies for the said degree has been assessed and graded by the University in time.

4. The candidate shall submit his application, at least three months before the commencement of the said examination of the dissertation not exceeding 2-3000 words.

5. The results of his research or important investigations carried out by him under the guidance of the research supervisor he elected to pursue his post graduate studies for the said degree, together with other documents pertinent to his/her research.

II. The appropriate examination examiners shall be appointed on the admission of the candidate to the examination.

5. Admission to the post graduate course will be given only in the first semester at the beginning of every academic year subject to the rules of the University.

STANDARD FOR ADMISSION

Regulation :-

- I Successful candidate shall score of the total marks
- II Successful candidate shall score for more of the total marks
- III Successful candidate shall score more the total marks

EXAMINATION IN

Regulation :-

The Ex. (I) shall consist of four parts for three days and thirty days

The characters of the papers shall be as follows :

- I. Each paper shall carry 100 marks.
- II. Each paper shall have a duration of three hours.
- III. There shall be four questions in each paper.
- IV. There shall be two sections in each paper.
- V. There shall be no optional questions.
- VI. The distribution of the topics in the papers shall be as under :-

Paper I : General Physiology, Comparative Physiology, Cell Physiology, Physical principles involved in Physiological Processes and Physiological Methodology.

Paper II : Physiological Chemistry, Dietetics and Metabolism.

Paper III : Systemic and Applied Human Physiology

Paper IV : History of Physiology, Biographies, and essay.

Total Maximum Marks 400

B) The character of the practicals will as follows :

- 1) The practical examination will be spread over three days.
- 2) One day shall be entirely devoted to practical examination in Physiological Chemistry.
- 3) The total number of questions including physiological Chemistry shall not be less than six and more than eight.
- 4) The total marks for the practical examination shall be 300 out of which 100 marks shall be allotted to practical Physiological Chemistry.
- 5) The viva voce shall be for a period 'ad libitum' on the aspects of theory, practical skill, results of experiments interpretations and the dissertation and will carry 100 marks.

Total Maximum Marks 400

C) The candidate appearing for the practical examination shall present the records of the work done by him/her to the examiners who may give credit to neat records, originality of methods, improvisations, organisation and conclusions drawn from the results obtained and recorded therein.

D) The candidate shall be expected to exhibit a fairly good knowledge of the recent current developments in the subject.

E) The records of the work done by the candidate may from the basis of the practical examinations at the said degree examination.

SYLLABUS IN HUMAN PHYSIOLOGY

Note : In the paras given below an indication of the subject to be studied is given, however, the candidate is expected to possess comprehensive knowledge of the subject in theory and to acquire fairly good skill at practicals and interpretation of the results obtained.

1. THEORY

- A) General Physiology
- B) Comparative Physiology
- C) Cell Physiology
- D) Methodology
- E) Physical Principles involved in Physiological Processes
- F) Physiological Chemistry
- G) Food and Dietetics
- H) Metabolism
- I) Systemic and Applied Human Physiology
- J) History of Physiology
- K) Biographies.

2. PRACTICALS

- A) Methods of stimulation of Animal Tissues in vivo and in vitro.
- B) Mounting of Contractile tissues of the study Physiological Phenomena in Vivo and in vitro.
- C) Perfusion of Organs to study Physiological Phenomena.
- D) Experimental studies of Mechanisms of the regulations of various systemic functions, in vivo and in vitro.
- E) Experimental studies of the functions of various parts of the Nervous system in vivo and vitro.
- F) Experimental studies of the Hemodynamics.
- G) Physiographic studies of various events in the functions of various systems in Human and in Animals.
- H) Quantitative studies in Hematology, Circulatory functions, Respiratory functions, Locomotor functions, Metabolic functions, Sensory functions, including special senses, Endocrine functions, Digestive function and Re-productive functions.
- I) Clinical studies for the Assessment of Normal functions of various systems in Human body.
- J) Qualitative and Quantitative studies of Physiological Chemistry, Metabolic functions in Isolated tissues, Animals and in Human.
- K) Operative techniques in experimental studies.
- L) Apparates, its use, constructions, maintenance.
- M) Interpretations of the results, and technical details of all work done for the study.

M.Sc. in Medical Subjects for Non-medical persons.

Ordinance :

The M.Sc. Degree in Medical sciences shall be conferred by written and practical examination with dissertation in the following branches of the Medical Sciences :- 1. Human Anatomy. 2. Human Physiology 3. Physiological Chemistry. 4. Pharmacology.

1. The examination for the said degree in various branches of Medical Sciences stated above shall be held twice a year.

2. The admission to the said degree course in the subject of Human Anatomy shall be given to the applicant.

I. Who has obtained the B.Sc. Degree at least in IInd class of the Faculty of Science of Poona University or of any other University equivalent to that of Poona University, with Zoology as principal subject.

Or
II Who has obtained the B.Sc. Degree at least in IInd Class in the subject of Veterinary Sciences provided this degree is recognised by the Poona University.

Or

III who has already obtained the M.Sc. Degree in one of the branches of Medical Sciences and now desires to present himself/herself for the same degree examination in another subject provided he/she fulfills all the conditions laid down below for a fresh applicant.

3. Alongwith the application for admission to the said degree examination, the candidate shall also submit to the Registrar, the following documents certifying that

I (for the candidate belonging to the categories 2 (I & II) above)

The candidate has satisfactorily completed the course of studies in Human Anatomy and Human Physiology as an orientation course for the period of the first two academic terms.

II The candidate has worked satisfactorily for the further period in continuity of four academic terms under the guidance of a recognised teacher under whom he/she elected to pursue his/her post-graduate studies.

III The candidate has maintained an up-to-date record in the prescribed book, of all the work done by him/her during the entire period of registration for the post graduate studies for the said degree and the same has been assessed and graded by the teacher Guide from time to time.

4. The candidate shall submit along with his application, at least three months before the date fixed for the commencement of the said examination, four copies of the dissertation not exceeding 2,600 words incorporating.

- I. The results of his/her own studies or important investigations carried out by him / her under the guidance of the recognised teacher under whom he/she is elected to pursue his/her post-graduate studies for the said degree, together with a review of the recent advances pertinent to his/her theme of dissertation.
 - II. The acceptance of the dissertation by the examiners shall be a condition precedent to the admission of the candidate for the written and practical examination.
5. Admission to applicants for the said degree course will be given once in a year by registration at the beginning of every academic year and shall be subject to the rules of the University in all other respects.

Standard for passing the Examination :

Regulation :

- I. Successful candidates scoring 50% or more of the total marks will be placed in SECOND CLASS.
- II. Successful candidates scoring 60% or more of the total marks will be placed in FIRST CLASS.
- III. Successful candidates scoring 75% or more of the total marks will be placed in DISTINCTION CLASS.

Examination in Human Anatomy

The examination for the degree of M.Sc. (Human Anatomy) shall be conducted in the following manner.

- 1) Written examination shall consist of four papers, each of 100 marks and of three hours duration.

The first three papers shall have each four questions, all compulsory. The fourth paper of essay shall carry only one question and shall have choice.

Paper I : Human Anatomy etc.
Paper II : Human Anatomy etc.
Paper III : Human Anatomy etc.
Paper IV : Essay.

- 11) Practical and oral examinations of a total of 400 marks spread over two to four days and consisting of :

- I. Dissection of human cadaver with viva on the same 100 Marks.
- II. Viva Voce on Human Anatomy 100 marks
- III. Practicals and orals in Histology and Embryology 100 marks
- IV. Discussion on the subject of dissertation and general viva-voce on the allied branches of Anatomy, including the estimate of candidate's capacity to teach the undergraduates. 100 Marks.