

**Institute of Environment & Development Studies
BUNDELKHAND UNIVERSITY, JHANSI**

***Ordinances and Scheme of Examination for Post PG programme
(M. Phil.) in Environmental Sciences.***

(Academic Session 2011 Onwards)

This academic course will run in the Department of Environmental Sciences under the Institute of Environment & Development Studies. It will be one-year course based on semester system of Examination.

Degree – Master of Philosophy in Environmental Sciences

Eligibility for Admission –

A candidate who has passed post-graduation course in Environmental Sciences / Biological sciences / Chemistry / Earth sciences / Agriculture with 55% marks in aggregate from any recognized Indian University/Institute or any other recognized organization is eligible to seek admission in M. Phil. (Environmental Sciences).

1. (a) Minimum qualification required for admission to the academic programs shall be as provided in the academic bulletin, acquired from any University/Institute in India or abroad, recognized by this University.
(b) Those appearing in the final year of the qualifying examination shall also be eligible to apply, provided that they submit specific proof of having passed the final year examination, with minimum requirement, at the time of admission/ personal interview, if qualified and called for.
2. PROCEDURE OF ADMISSION: Admission to eligible candidates will be given strictly on merit, drawn on the basis of merit in the Common Admission Test for Environmental Sciences or as per procedure decided by appropriate authorities of the University.
3. NORMAL INTAKE: The intake for the various academic programs will be as provided in the academic bulletin of each academic year. Statutory reservation, as applicable, shall be applied as per rules.
4. MEDIUM OF INSTRUCTION shall be English.
5. METHOD OF TEACHING in the academic program will consist of a combination of class lectures by the regular faculty, in-house visiting faculty and visiting faculty from other academic institutions/ organizations. Tutorials, Seminars, Site visits and Project-work shall be essential components of the curriculum. Quality study material will also be supplied besides computer-aided instructions and audio-visual teaching methods (if possible).

6. ATTENDANCE: Minimum attendance required to be eligible to appear in the examination shall be 75% of all class lectures (theory & practical), seminars, tests, tours and project work taken together for all papers and also for each paper separately. In case a student is short of attendance due to illness, participation in sports and extra-curricular activities etc., the following shall apply:
- (a) A shortage of up to 10% shall be condoned by the HOD on the specific recommendations of the class teacher.
 - (b) A shortage of up to 25% may be condoned by a committee constituted by the appropriate authority of the University, on medical grounds or may other reasonable ground on recommendation of HoD.

7. SCHEME OF EXAMINATIONS

M. Phil. in Environmental Sciences shall be a one-year full time course comprising two semesters. Each semester shall consist of 90 teaching days including theory, practical, seminar, Sessional and educational tour. Educational tour/training (if required for research work) courses will be carried out at particular institutes and industrial/natural areas.

All the papers will carry 100 marks, except dissertation (200 marks) and will be organized in following manner:

External assessment/examination	:	75 marks
Internal assessment (Sessional Examination)	:	25 marks
Total	:	100

marks

The theory question papers (of 75 marks) will consist (15 marks), short-answer (30 marks) and descriptive type (30 marks), and will be set by paper setter/ examiner. A model question paper will be supplied to every paper setter for apprising about the likely pattern of questions.

- (a) Semester Examination: the University shall conduct it, normally after completion of 90 days of teaching. The question paper will be set by the Examiners, appointed by the Vice-Chancellor from the names recommended by the Board of Studies. It shall be a general policy that 50% of the theory papers in each semester shall be external.
- (b) Practical Examination: in semester year a practical Examination (including practical records/Internal assessment and viva - voice) based on course contents offered in the each year shall be conducted. The Vice-Chancellor will select both the external and internal examiners from the names recommended by the Board of Studies. Similar scheme will be followed for the examination of Project work/ Dissertation.
- (c) Minimum Passing Marks:

40%: - Qualifying marks	
50% and above - Second Division	B Grade
60% and above - First Division	A Grade
80% and above – Distinction	A+ Grade

The student will have to clear all the papers, separately with 40% marks in aggregate. In case a student fails to clear any one or more of the papers, he/she

shall be given a second chance to clear the backlog by taking a back-paper examination, which shall be conducted separately or along with the annual examination at the end of academic examination in which the said course is being offered. In the meantime, the student will be given provisional admission in the next academic session.

A student will have to clear all the papers by the end of the final year/degree program in order to be eligible for the award of the relevant degree by the University.

In case a student is unable to clear all the papers by the end of the course, he/she may be allowed to reappear, in subsequent examinations, as an ex-student, without undergoing a repeat of regular academic programs. They shall be required to appear and clear only those papers; practical in which they could not secure minimum pass marks. The marks in subject already cleared shall be carried over as such.

Course Structure (Year 2010 onwards)

Course Structure of M. PHIL. (Environmental Sciences) shall be as below:

Semester - I : 400 marks

DESMP – 101	:	Ecology, Geology and Eco -conservation (100)
DESMP – 102	:	Environmental Pollution, Toxicology & Disaster Management (100)
DESMP – 103	:	Environmental Research Methodology (100)
DESMP – 104	:	Case Assignment, Practical & Seminars (100)

Semester- II : 200 marks

DESMP – 201 : Dissertation (200) - And marks shall be distributed as 100 for evaluation (Average marks of Two external evaluator); 50 for Viva and 50 for Seminar respectively.

Dissertation work shall be done in the Departmental Laboratory under the supervision of any faculty who has research degree in the area of environment. If any candidate would like to done their dissertation work from any other National institute/ organizations then all the expenses shall be bear by the candidate himself/herself as per rule by the respective organization.

A pre-submission dissertation seminar shall be required in front of a Committee may be departmental or at least one member from outside of the department.

COURSE SYLLABUS OF M. Phil. (Environmental Sciences)

Semester – I: 400 marks

DESMP -101: ECOLOGY, GEOLOGY & ECO-CONSERVATION

Unit - I: Basic ecological principles, Concept of carrying capacity; Ecosystems and biomes; Energy flow in ecosystems; Process of succession and retrogression; Ecological factors; Ecology & sustainability;

Unit - II: Concept of Bioremediation; Restoration of Lakes, Rivers, Marine ecosystems; Restoration of land ecosystems; Silviculture, Rangeland management, Minor Forest Produce, JFM, Agro-forestry, Wastelands reclamation.

Unit – III : Biodiversity –definition, levels and types of biodiversity; Value of biodiversity; Threat to biodiversity; Biodiversity conservation- In-situ & Ex-situ; conservation through biotechnology, Gene pool, Conservation through legal aspects; Biodiversity at Global & National level; Future strategies for India; Bio-geographical classification, Hot-spots of Biodiversity, plant genome studies and mutation.

Unit – IV : Concept of Forest ecology, Role of vegetation in nature; Forest types of India; Forest management & conservation; Importance of wildlife; Common flora and fauna in India; Endangered and threatened species; Protected Areas; National Parks and Sanctuaries; Role of National and International organizations for protection of wildlife; Biodiversity Laws, conservation of water resources, rain water harvesting.

Unit – V : The Earth; origin. Structure & composition; historical life through geological time, concept of stratigraphy, geomorphology by natural processes, folds, faults, methodological dating of rocks, concept of seismology, tectonic framework of India, concept of plate tectonics, concept of isostasy, landslides, profile of the ocean floor, principal ocean current, marine resources, concept of rocks and minerals, natural resource management; fossil fuel: coal, petroleum, fundamentals of meteorology, types of winds, pressure and temperature belts in the Earth surface, Climate regionalization of India, Global climate change, Hydrological cycle, biogeochemical cycle, remote sensing applications on environment.

DESMP -102: ENVIRONMENTAL POLLUTION, TOXICOLOGY & DISASTER MANAGEMENT

Unit - I: Environmental pollution, Aerosol studies, Air, Water, Soil and noise pollution, control - Sources, effect on environmental quality and health; Environmental issues of the 21st century; Important environmental accidents. Legislation and regulation for pollution control;

Unit – II : Classification of toxicants and their chemistry; Chemistry of particulate and gaseous pollutants; Concept of fog, smog and acid rain; Atmospheric chemistry of ozone; Chemistry of food additives, detergents, paints, plastic, Drugs; Effect of toxicants on individual species, community & ecosystem level; Environmental health – air, water, food & soil borne diseases; Prevention & control.

Unit – III: Principles and mechanism of toxicity; Biotransformation, bioactivation, biodegradation, biomagnification of toxicants; systems toxicity; Pathological problems peculiar to ecotoxicology; Dose-response relationship; Exposure assessment; Influence of ecological factors on effects of toxicity; Somatic & germinal effects, biological disaster management, studies of cell and molecular biology using concepts of electron microscope, concept of DNA replication and real time PCR. fluorescence, microscopy.

Unit - IV: Institutional framework of disaster management in India; Disaster management in industries – emergency planning, preparedness, response; Natural disasters, concept of earthquake, tsunami, landslide, land subsidence and forest fire, hazard reduction, mitigation and control; Disaster preparedness for natural hazards; Safety Audit;; Accident management, rescue, relief and rehabilitation; community organization and their role; ISO series.

DESM – 103 : ENVIRONMENTAL RESEARCH METHODOLOGY

Unit – I : Meaning & Objectives of Research, Motivation of Research, Types of Research; Research approaches, Significance of research; Research methods versus methodology; Research & scientific methods; Importance of how research is done; Criteria of good & advanced research; Problems encountered by research in India.

Unit – II : Defining the research problem; Research design, Sampling design; Measurement & scaling technique; Methods of data collection; Processing and analysis of data; Fundamentals of sampling; Testing of hypothesis; Chi-square test, ANOVA test etc.

Unit – III : Multivariate analysis techniques – Characteristics, application, classification and important methods for multivariate analysis technique; Interpretation & Report writing – meaning, technique, significance of report writing;

Unit - IV : Concept of EIA, methods of Environmental Impact analysis, EIS, Elements of EIA, procedure for reviewing EIA and Statement; Environmental Auditing.

Unit – V : Air and water quality monitoring. Noise and its monitoring. Basics of computer and its applications in Research. Concepts of remote sensing &

GIS, Concept of XRF, AAS, ICPAES, Spectroradiometer, Gel electrophoresis, Microscopy and real time PCR.

DESMP –104 : CASE ASSIGNMENT, PRACTICAL & SEMINARS

- Case assignment shall be comprehensive Self Study project report based on candidate own work regarding the Environmental Education / Awareness / respective environmental problems etc.
- Practical – analytical work of Air, Water, Soil, Plant samples etc. in the lab.
- In each semester candidate shall appear at least Three seminar before examination related to his/her syllabus.

Semester - II : 200 marks

DESMP –201 : DISSERTATION – Viva/Seminar (200)

8. A candidate who has discontinued the academic program during any year/semester may on the recommendation of the HOD be permitted by the Vice-Chancellor to take re-admission in the academic program at the beginning of the semester/year concerned, in a subsequent year, not however beyond a gap of two years. Fee once paid shall not be adjusted or refunded during subsequent admissions.
9. Subject to the statutes and ordinances of the University. The students shall remain under the control of Coordinator or Head of the department.
10. The course fee and examination fee shall be decided by the University from time to time and will have to be deposited by the candidate, as and when asked for.
11. The academic programs may be conducted in collaboration with any institution where necessary facilities are available.
12. Above rules are subject to amendment by appropriate authorities of the University from time to time, as and when deemed necessary.
13. In view of the need in the actual implementation of the course, the adaptations and amendments, if any, by the Board of Studies, or the Expert Committee appointed by the Vice-Chancellor for the respective course/subject, for the first ordinances, shall be deemed passed and hence incorporated.