

Syllabus for Ph.D. Coursework in Environmental Science



(w.e.f. the session 2020-21)



**POST GRADUATE DEPARTMENT OF BOTANY
UTKAL UNIVERSITY
BHUBANESWAR-751004**

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Ph.D. COURSEWORK in ENVIRONMENTAL SCIENCE

P.G. Department of Botany, Utkal University, Vani Vihar, Bhubaneswar

To be effective from the session 2020-2021

Eligibility

Any student who has passed M.Sc./M.Tech. in Environmental Science/Life science/Botany/Zoology/Geography/Geology/Physics/Chemistry/Forestry/Agricultural Science/Fishery/allied science and engineering and having minimum of 50% marks in Masters level.

Admission

The candidates are to take admission after qualifying in an entrance test as per university guidelines. The merit list will be prepared after recommendation of SRC. The admission will be strictly as per the merit list in each category as per university norms.

Course and Regulation

1. The course is of six months duration with one semester for two theory paper, one review paper presentation and one seminar presentation.
2. Each paper carries 100 marks and six credit points.
3. The semester system of examination will have internal system of evaluation as suggested and approved by Teacher's council.
4. In order to pass a semester examination a candidate must have to secure a minimum of 60% marks in aggregate and a minimum 50% mark is essential to pass in each paper.
5. Attendance in the semester shall be strictly adhered to University Rules.

Details of the Syllabus:

Paper	Title	Marks allotted	Credit
I.	Research Methodology	100	06
II.	Core Paper-Environmental Science	100	06
III.	Review Paper Presentation	100	06
IV.	Seminar Presentation	100	06
Total		400	24

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Detailed syllabus for Paper -I Research Methodology

P. G. Dept. of Botany, Utkal University

Credits: 06 FM: 100

Unit I

General Analytical Techniques: Concept of pH and buffer, Chromatography: techniques & application, Electrophoresis: techniques & principle, microscopy. *Spectroscopic Techniques:* UV-Visible spectrophotometry, Atomic absorption spectrophotometry, Plant Efficiency Analyser.

Unit II

Statistical Methods: Measures of Central tendency of data, t- and χ^2 -test, F-test, correlation and regression analysis.

Unit III

Computer Application: MS office, Internetworking concept, bioinformatics application, Fundamental of Remote Sensing and Geographical Information System (GIS) and its application in various areas.

Unit IV

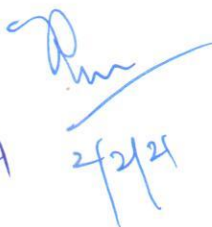
Review and Research article: Differences between review and original research article, types of review articles, writing research article and thesis, reference/bibliography formats.

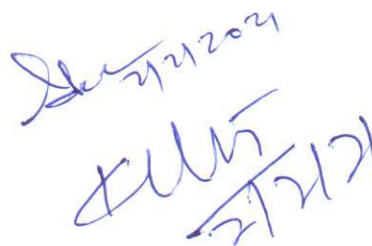
Unit V

Research ethics: Philosophy and ethics, scientific conduct; publication ethics; open access; publishing, publication misconduct, databases & research metrics.



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Detailed syllabus Paper-II

Core Paper- ENVIRONMENTAL SCIENCE
P.G. Dept. of Botany, Utkal University

Credits: 06 FM: 100

Unit-I

Fundamental of Ecology and Environment: Concept of ecology and environmental science, Ecosystem, ecosystem energetics, Ecosystem productivity, community ecology.

Unit-II

Natural Resources and Management: Mineral Resources of India and Odisha in particular. Environmental impacts of mineral exploitation and environmental management plans. Biodiversity conservation, Alternate Energy resources.

Unit-III

Environmental Pollution and Monitoring: Methods of monitoring of air pollutants, control techniques. Water and soil pollution, Bio-monitoring.

Unit IV

Instrumentation techniques, statistical models and Disaster management: Analytical methods: BOD, COD measurement, Dust Sampler. Concept of disaster management, Lotka- Volterra model, Box model, Gaussian plume model, Validation and forecasting.

Unit V

Environmental Impact Assessment and Climate Change: Concept of Environmental Management System (EMS) and Environmental Impact Assessment (EIA), Air pollution, Emission of GHGs, Climate Change and its impact.

Paper-III: Review paper Presentation

Credits: 06 FM: 100

The candidate has to present a complete review paper pertaining to his/her probable research topic and also to submit a hardcopy of the same not exceeding 2000 words.

Paper-IV: Seminar Presentation

Credits: 06 FM: 100

The candidate has to present a paper pertaining to his/her topic of interest in the relevant subject and also to submit a hardcopy of the same not exceeding 1000 words.

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