

Egra Sarada Shashi Bhusan College

Under

Vidyasagar University

Ph.D Course Work Syllabus

on

Coastal Environmental Studies

Semester	Course No	Course Name	Lecture (Hours)	Credit
Ph.D Course Work (50 x 4 = 200)	CES-I	Research Methodology & Research Ethics	10	4
	CES-II	Environmental History	10	4
	CES-III	Concept and Techniques in Environmental Studies or Statistics for Environmental Studies	10	4
	CES IV	Submission of assignment: a. Review of literature or data generated on the related research topic b. Power point presentation on a research topic	10	4

Ph.D Course work

Credit= 4x 4 = 16

FM: 50 X 4 = 200

Course 1: CES I: Research Methodology & Research Ethics:

A. Research Methodology:

1. Research definition, importance, meaning and characteristic. Steps in research.
2. Research problem: identification, selection and formulation
3. Sampling: definition, theory, types, techniques and steps. Sample size, advantage and limitation of sampling.
4. Data: definition, sources and types. Data collection method. Analysis of data
5. Review of literature and Bibliography
6. Research report: types, contents, styles and steps in drafting. Editing the final draft and thesis writing
7. Significance of Impact factor, citation index, SCI, H-index, SCOPUS
8. Problems encountered by researchers in India

B. Research ethics:

1. Research and Publication Ethics (RPE)
2. Awareness about the publication ethics and publication misconduct
3. Pedagogy

Course 2: CES II: Environmental History

1. Global environmental history
2. Forest, deforestation, soil erosion, resistance, politics of environment, subsistence, the animal and insect worlds in tropical forests and hunting
3. Basic principle of ecosystem functioning: wetland, coast and Forest
4. Climate, impact of climatic changes on history, demography, natural calamities such as earthquakes, cyclonic storms, hurricanes, tornadoes, floods, rainfall, tsunamis, volcanic eruptions, mudslides and forest fires.
5. Air, Water and soil pollution and impacts on biodiversity.

6. Environmental management with special reference to EIA
7. History of public health, epidemics, medicine.

Course 3 : CES III A: Concept and Techniques in Environmental Studies

1. Environmental Resources and the Urban Ecology
2. Environmental Toxicology, Health and Safety
3. **Green Chemistry:** Principles of Green Chemistry, Examples, Renewables for Sustainability, Green Synthesis, Plant secondary metabolites, Terpenoids: Biogenesis, Biosynthesis, Triterpenoids as Renewable Nano-entities
4. **Application of advanced techniques to study micro and macromolecular interaction/ Characterization:** Interaction of complexes with DNA, RNA and Serum proteins monitored by (a) UV-Vis spectroscopy (b) UV-thermal melting (c) Fluorescence spectroscopy (e) IR Spectroscopy (f) NMR Spectroscopy (g) Mass Spectroscopy (h) X Ray Crystallography.
5. **Separation Techniques of Biomolecules:** (a) Thin Layer Chromatography (b) Column Chromatography (c) HPLC
6. PCR: primer designing, methodology and applications
7. DNA and Protein sequencing

Course 4: CES-III B: Statistics and Computer Application for Environmental Studies

1. Basic Statistics, Organization of data - array, frequency, class intervals, histograms, and distribution, Presentation of Data: Tables, Diagrams
2. Grouped data and ungrouped data, Geographical data: discrete and continuous series, scales of measurement, Measures of Central Tendency - mean, median, mode, quartiles, Skewness and Kurtosis
3. Correlation: meaning, scatter diagram, standard deviation, variance, Measures of correlation – Karl Pearson's method (two variables ungrouped data), Spearman's rank correlation methods.
4. Concept of variables, vectors, probability and sampling / sampling design and applications, Hypotheses and their testing.
5. Bivariate correlation and linear regression: problem of estimation and problem of inferences.
6. Spreadsheet Tool: Introduction to spreadsheet application, features and functions, using formulas and functions, Data storing, Features for Statistical data analysis, Generating charts/ graph and other features. Tools may be used in Microsoft Excel, Open office or any other available software.
7. Presentation Tool: Introduction to presentation tool, features and functions, Creating presentation, Customizing presentation, showing presentation. Tools may be used in Microsoft Power Point, Open Office or similar tool and Web Search: Introduction to Internet, Use of Internet and WWW, Using search engine like Google, Yahoo etc, Using advanced search techniques.
8. Software packages: SPSS, R-statistics, MATLAB, EMBOS

Course 5: CES-IV: Submission of assignment

1. A literature of review or data generated on the related research topic be submitted by each scholar duly signed and recommended by the supervisor (s)
2. Power point presentation on a researchable topic (Selected by Supervisor)
3. Analysis of data using MS-Excel or statistical methods