Course Description:

This course introduces students to data analysis techniques commonly used in environmental science. Students will learn methods of data collection, statistical analysis, data visualization, and interpretation of environmental datasets. Emphasis is placed on real-world applications using environmental case studies and developing skills in statistical software.

Course Objectives:

By the end of this course, students will be able to:

- Understand basic statistical concepts applied to environmental data.
- Perform exploratory data analysis and descriptive statistics.
- Conduct hypothesis testing and regression analysis.
- Analyze time series and spatial data in environmental contexts.
- Visualize environmental data effectively using graphs and maps.
- Interpret and communicate data-driven findings in environmental science.

Prerequisites:

Introductory Statistics or Instructor Approval.

Textbook (Recommended):

- *Statistics for Environmental Science and Management* by Bryan F.J. Manly (latest edition)
- *Practical Statistics for Environmental and Biological Scientists* by John Townend (optional supplementary)

Software:

- R (preferred) or Python (optional)
- Excel or equivalent spreadsheet software
- QGIS (for basic spatial analysis)

Weekly Topics:

Week	Topics
1	Introduction to Environmental Data and Data Management
2	Descriptive Statistics and Data Summarization
3	Probability Concepts and Distributions
4	Hypothesis Testing and Confidence Intervals
5	Analysis of Variance (ANOVA)

Week	Topics
6	Correlation and Linear Regression
7	Multiple Regression and Model Selection
8	Non-parametric Tests in Environmental Data
9	Introduction to Time Series Analysis
10	Spatial Data Basics and Geostatistics
11	Multivariate Analysis (PCA, Cluster Analysis)
12	Data Visualization Techniques (Graphs, Maps, Dashboards)
13	Case Studies in Environmental Monitoring (Air, Water, Soil)
14	Final Project Presentations

Assessment:

- Weekly Assignments and Quizzes (25%)
- Midterm Exam (20%)
- Final Project (30%)
- Final Exam (20%)
- Participation and Discussions (5%)

Final Project:

Students will select an environmental dataset (or be assigned one) and apply the learned methods to analyze it. Deliverables include a written report and a presentation.

Course Policies:

- Attendance and active participation are important.
- Assignments must be submitted on time unless prior arrangements are made.
- Collaboration is encouraged, but all submitted work must be individual unless specified.

Important Dates:

- Midterm Exam: Week 7
- Final Exam: Week 14
- Final Project Due: Week 13