



ENVIRONMENTAL SCIENCES GRADUATE PROGRAM AREA OF CONCENTRATION IN QUANTITATIVE ANALYSIS

PURPOSE

The Area of Concentration of Quantitative Analysis is designed for students with interests in mathematics, statistics or computing who wish to augment their quantitative skills, study the use of those skills in environmental research, and explore a specific field(s) of application in some depth. The goal is to train environmental scientists who combine conversance in mathematics, statistics and computing with a thorough grounding in the subject matter of a specific area, including an awareness of the strengths and limitations' of data collected in that area.

In addition to satisfying a basic requirement in statistics, students select from courses in quantitative analysis, including the planning of experimental and observational studies, the analysis of data accruing from such studies, and the quantitative modeling of natural systems. Courses in a science focal area of their choice are also required. Entering students should have at least one year of college-level calculus, and sufficient background in an environmental science to take graduate courses in their chosen science focal area.

PROGRAM OF STUDY

Course work is divided into 6 categories: ES Core courses, Statistics Core courses, Quantitative Analysis courses, Science Focal Area courses, Elective courses, and Thesis. Total credits required are a minimum of 45 Cr for the M.S. and M.A. degree and 108 Cr for the Ph.D. degree. Typical Programs of Study will include minimum credits as follow:

<u>Subject Area</u>	<u>M.S. & M.A. Degrees</u>	<u>Ph. D. Degree</u>
ES Core Courses	9-12 Cr	10-12 Cr
Statistics Core Courses	12 Cr	12 Cr
Quantitative Analysis Courses	9 Cr	18-32 Cr
Science Focal Area Courses	6-9 Cr	12-18 Cr
Electives	0 Cr	0-20 Cr
Thesis	6-9 Cr	36-56 Cr
Total	45 Cr	108 Cr

CORE COURSES

9-12 Cr. for the M.S and M.A. degree (required are ENSC 515, 520, 508 and one class from the approved list of core courses- below) and 10-12 Cr. for the Ph. D. degree. (required are ENSC 515, 520, 508 and classes from the approved list of core courses- below). These courses include Environmental Perspectives, Environmental Analysis, Environmental Profiles, and the Joint-Campus Workshop in Environmental Science, Studies, and Policy.

Approved Core Course List:

ANTH 581	Natural Resources and Community Values
ANTH 582	World Food and the Cultural Implications of International Development
BI 570	Community Structure and Analysis
BI 670	Community Structure and Analysis
CE 513	GIS in Water Resources
Comm 540	Theories of Conflict and Conflict Management
EC 539	Public Policy Analysis
FOR 561	Forest Policy Analysis
FS520	Posing Researchable Questions
FS521	Natural Resource Research Plan
FS565	Forest Ecosystem Management

FS646	Ecosystem Analysis and Evaluation
FW515	Model Selection and Inference
GEO 520	Geography of Resource Use
H524	Health Data Analysis
H525	Intro Epidemiology
H526	Epidemiological Methods
H549	Health Risk Communication
H575	Evaluation
H576	Proposal Writing
HIST 569	History of the Pacific Northwest
LA 607	Experimental Seminar in Biocomplexity and Alternative Futures
MRM515	Coastal Resources Management
PS 574	Bureaucratic Politics and Policy
PS 575	Politics of Environmental Problems
PS 576	Science and Politics
SED 580	Research and Evaluation
SOC 581	Society and Natural Resources
Z582	Molecular Methods in Ecology and Evolution

STATISTICS CORE COURSES

12 Credits for M.S., M.A. and Ph.D. degrees. These courses are to ensure that all students in the Quantitative Analysis track gain a basic familiarity with the theory of probability and statistics and the methodology of data analysis.

ST 521 Introduction to Mathematical Statistics
ST 511, 512 Methods of Data Analysis

QUANTITATIVE ANALYSIS COURSES

BI 570 Community Structure and Analysis
BEE 571 Biosystems Modeling Techniques
BEE 525 Stochastic Hydrology
CSS 590 Field-Plot Technique
FOR 525 Forest Modeling
FS 523 Natural Resource Data Analysis
GEO 541 Spatial Variation in Ecology and Earth Science
H 525 Principles of Epidemiology
H 526 Epidemiologic Methods
MTH 559 Topics in Mathematical Modeling
OC 682 Oceanographic and Atmospheric Data Analysis I
OC 683 Oceanographic and Atmospheric Data Analysis II
ST 513 Methods of Data Analysis
ST 515 Design and Analysis of Planned Experiments
ST 522 Introduction to Mathematical Statistics
ST 531 Sampling Methods
ST 535 Quantitative Ecology
ST 541 Probability, Computing and Simulation in Statistics
ST 543 Applied Stochastic Models
ST 571 Environmental Statistics
ST 573 Environmental Sampling
ST 557 Applied Multivariate Analysis
ST 565 Time Series Models
ST 623 Generalized Regression Models I

SCIENCE FOCAL AREA COURSES

6-9 Cr for M.S. and M.A. degree and 12-18 Cr for Ph.D. degree. These courses are intended to broaden the Program of Study by acquainting the student with subject matter in areas of environmental science to which quantitative analysis may be applied. The courses are to be selected from the Ecology Courses in the Area of Concentration in Ecology; the Basic Earth System Courses and Science Focal Area Courses in the Area of Concentration in Biogeochemistry; and the Social Science Environmental Topics in the Area of Concentration in

Social Science. A single course may not be used to satisfy both the Science Focal Area requirement and the Quantitative Analysis requirement.

ELECTIVE COURSES

0 CreditS for M.S. and M.A. degrees and 0-20 Credit for Ph.D. degree. Students will work with their graduate advisor and committee to select elective courses to develop necessary background and to add depth to the student's Program of Study.

THESIS:

The thesis requirement includes 6-9 Cr for a M.S. and M.A. degree and 36-56 Cr for a Ph. D. degree.