Environmental Analysis and Decision Making

The Wiess School of Natural Sciences

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Degrees Offered: M.S.

Rice University introduced a professional master's degree in environmental analysis and decision making in fall 2002. This degree is geared to teach students rigorous methods that are needed by industrial and governmental organizations to deal with environmental issues. As an interdisciplinary program, it aims to give students the ability to predict environmental problems, not just solve them. It emphasizes core quantitative topics such as statistics, remote sensing, data analysis, and modeling. In addition, it teaches laboratory and computer skills and allows students to focus their education by taking electives in relevant fields.

The environmental analysis and decision making degree is one of three tracks in the new Professional Master's Program at Rice housed in the Wiess School of Natural Sciences. These master's degrees are designed for students seeking to gain further scientific core expertise coupled with enhanced management and communications skills. These degrees instill a level of scholastic proficiency that exceeds that of the bachelor's level, and they create the cross-functional aptitudes needed in modern industry. This program will allow students to move more easily into management careers in consulting or research and development, design, and marketing of new science-based products.

Degree Requirements for M.S. in Environmental Analysis and Decision Making

The 21-month professional master's program begins with two semesters of course work at Rice followed by a six-month industrial internship. After the internship, students return to Rice for a final semester of course work. In addition to taking technical courses, students in the Environmental Analysis and Decision Making Program will take two management courses, one science policy and ethics course, and a seminar jointly with the students involved in the other professional master's tracks. No thesis is required; however, students are required to present their internship projects in both oral and written form in the Professional Master's Seminar. Students also are required to attend events organized by the Rice Alliance for Technology and Entrepreneurship and will be guided in courses by the efforts of the Cain Project in Engineering and Professional Communication. Working professionals my be considered for part-time enrollment.

For general university requirements for graduate study, see pages 65–70, and see also Professional Degrees, page 66.

To ensure that all students obtain an excellent quantitative background, each student will be required to take the core courses listed below. If a student can demonstrate that s/he has learned the material elsewhere, s/he may be exempted. Students pursuing this degree part-time will meet with their assigned advisor to determine their coursework schedule.

Year 1

Fall Semester
1 or 2 electives*
STAT 305 *Introduction to Statistics for Biosciences with 1 hour environmental lab***
STAT 410 *Introduction to Statistical Computing and Linear Models*
Or STAT 385 *Methods for Data Analysis* (offered in spring)
CEVE 401 *Introduction to Environmental Chemistry with lab*
MGMT 750 *Management for Science and Engineering*
NSCI 501 *Professional Master's Seminar*
* Dependent on the choice of STAT 410 or STAT 385
** Only required for students with no statistical background

Spring Semester
1 or 2 electives*
CEVE 412 *Hydrology and Watershed Analysis*
CEVE 512 *Hydrology and Watershed Analysis lab*
NSCI 501 *Professional Master's Seminar*
STAT 685 *Quantitative Environmental Decision Making*
*Dependent on the choice of STAT 410 or STAT 385

Summer Semester
Industrial Internship

Year 2

Fall Semester
NSCI 510 *Industrial Internship*

Spring Semester
2 electives
NSCI 511 *Science Policy and Ethics*
ESCI 450 *Remote Sensing*
NSCI 501 *Professional Master's Seminar*

Elective Courses: In addition to taking the core courses, the student will choose 5 electives from the list below. We recommend that three of the electives be in one of the focus areas: sustainability, biological sciences, chemistry, fluids and transport, engineering, or advanced computation. At least one should be from the management and policy area.

Sustainable Development
XXXX *Introduction to Sustainable Development*
BIOS 322 *Global Ecosystem Dynamics*
BIOS 325 *Ecology*
CEVE 406 *Introduction to Environmental Law*
CEVE 411 *Air Resource Management*
CEVE 434 *Chemical Transport and Fate in Environment*

ECON 480 *Environmental Economics*
ESCI 353 *Environmental Geochemistry*
MGMT 617 *Managerial Decision Making*
MGMT 661 *International Business Law*
MGMT 674 *Production and Operations Management*
MGMT 676 *Project Management/Project Finance*
MGMT 721 *General Business Law*
SOCI 367 *Environmental Sociology*

Management and Policy
CEVE 406 *Introduction to Environmental Law*
ECON 480 *Environmental Economics*
ENGI 303 / CEVE 322 *Engineering Economics for Engineers*
MGMT 721 *General Business Law*
MGMT 661 *International Business Law*
MGMT 617 *Managerial Decision Making*
MGMT 751 *New Venture Creation in Science and Engineering*
MGMT 674 *Production and Operations Management*
MGMT 676 *Project Management / Project Finance*
MGMT 636 *Systems Analysis and Database Design*
SOCI 367 *Environmental Sociology*

Biological Sciences
BIOS 322 *Global Ecosystem Dynamics*
BIOS 324 *Wetland Ecosystems*
BIOS 325 *Ecology*
BIOS 424 *Microbiology and Biotechnology*
BIOS 425 *Plant Molecular Biology*
CEVE 536 *Environmental Biotechnology*
ESCI 468 *Paleoclimate and Human Response*

Chemistry
CENG 630 *Chemical Engineering of Nanostructured Materials*
CEVE 511 *Atmospheric Chemistry and Physics*
CEVE 550 *Applied Water Chemistry*
ESCI 353 *Environmental Geochemistry*

Fluid Dynamics and Transport
CENG 571/671 *Flow & Transport in Porous Media I & II*
MECH 371/372 *Fluid Mechanics I & II*
MECH 454/554 *Finite Element Methods in Fluid Mechanics*
MECH 673 *Advanced Fluid Mechanics I*

Engineering
CEVE 411 *Air Resource Management*
CEVE 434 *Chemical Transport and Fate in the Environment*
CEVE 530 *Physical/Chemical Processes in Environmental Engineering*
CEVE 640 *Advanced Topics in Environmental Engineering*

Advanced Computation
CAAM 378 *Advanced Computation*
CAAM 420 *Computational Science I*
CAAM 451 *Numerical Linear Algebra*
CAAM 452 *Computational Methods for Differential Equations*
CAAM 454 *Optimization Problems in Computational Engineering and Science*
COMP 361 *Visual Methods for Science and Engineering*
ESCI 441 *Geophysical Data Analysis*
ESCI 454 *Geographic Information Systems*
MECH 454/554 *Finite Element Methods in Fluid Mechanics*
MECH 343 *Modeling of Dynamic Systems*
MECH 417/517 *Finite Element Analysis*
MECH 420 *Feedback Control of Dynamical Systems*
MECH 563/ CAAM 563 *Engineering Approach to Mathematical Programming*
MECH 679 / CIVI 679 *Applied Monte Carlo Analysis*
STAT 421 *Methods in Computational Finance II*
STAT 422 *Bayesian Data Analysis*
STAT 431 *Mathematical Statistics*
STAT 540 *Practicum in Statistical Modeling*
STAT 541 *Multivariate Analysis*
STAT 546 *Design and Analysis of Experiments and Sampling Theory*
STAT 553 *Biostatistics*