

The Johns Hopkins University
Department of Geography and Environmental Engineering
Undergraduate Programs in Environmental Engineering

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INTRODUCTION

The field of Environmental Engineering is dedicated to the study and amelioration of environmental problems. Such problems are complex and multifaceted, and successful solutions must operate within the constraints imposed by societal concerns. As a result, the discipline of Environmental Engineering is a highly interdisciplinary endeavor. Our B.S. program (implemented for the first time during the 2002/2003 academic year) is intended to provide a strong foundation in the physical, chemical and biological sciences, as well as in mathematics, engineering science and engineering design. It is broad and flexible enough to accommodate students with a variety of interests in Environmental Engineering. This training should provide an ideal preparation for future employment in business or industry or for subsequent training at the graduate level, either in Environmental Engineering or in a field such as environmental law, public health, or medicine.

The purpose of this advising manual is to facilitate the advising process for majors and minors by compiling program requirements, rules, and curricula.

Academic Programs

The Department of Geography and Environmental Engineering offers three distinct programs for undergraduates at Johns Hopkins:

- The Bachelor of Science in Environmental Engineering program is designed to provide students with a broadly based yet rigorous education in the fundamental subjects central to the field, in a milieu that fosters development of a spirit of intellectual inquiry and the problem-solving skills required to address the open-ended issues characteristic of the real world.
- The Minor in Environmental Engineering is designed to allow engineering students to pursue an interest in this field and to incorporate aspects of environmental engineering into careers in other engineering disciplines.
- The Minor in Environmental Science is designed to encourage and facilitate studies in environmental science by students completing degrees in other science and engineering disciplines.

Advising

The Department's coordinator for undergraduate advising for the 2009/2010 academic year is:

Professor William Ball
301 Ames Hall
3400 N. Charles Street
Baltimore, MD 21218
(410) 516-5434, bball@jhu.edu

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All undergraduate students majoring in Environmental Engineering must follow a program approved by a faculty member in the Department who is appointed as the student's advisor. Each student should see the faculty advisor to (a) plan his/her course schedule, (b) change his/her course schedule if necessary, (c) discuss requirements for the major, and (d) discuss any problems that relate to academics or academic performance. It is the responsibility of the student to initiate and attend regular meetings with the advisor.

It is recommended that each student meet with his/her advisor at least twice a semester. For example, a meeting with the advisor approximately four weeks after classes begin provides a useful time to inform the advisor of potential difficulties or problems in individual courses. The second meeting with the advisor would typically occur towards the end of the semester during advising week, when decisions must be made on course registration for the following semester. Note in this regard that undergraduate advising week is the week BEFORE undergraduate registration week. Please schedule an appointment with your advisor, since he or she will likely have a particularly busy schedule during advising week.

GENERAL REGULATIONS FOR THE ENVIRONMENTAL ENGINEERING MAJOR

All undergraduate students majoring in Environmental Engineering must follow a program approved by a faculty member in the Department who is appointed as the student's advisor.

Course and Grade Regulations

The Department of Geography and Environmental Engineering requires that all courses taken after the first semester of the freshman year and counted toward the 124 credits required for Environmental Engineering be taken for a letter grade (that is, they may not be taken with the Satisfactory/Unsatisfactory option). The University regulations are on page 40 of the catalog. Whereas the University allows one S/U course each semester *outside the student's major*, the Department does not allow any S/U courses (except those in the first semester of the Freshman year) to count toward the requirements for graduation.

Further, the Department of Geography and Environmental Engineering requires that grades of C- or better be obtained in all required Engineering, Mathematics and Science courses (i.e., grades of D or D+ will not be accepted). This also applies to required electives in those three areas. No more than ten D credits may be counted toward graduation requirements.

According to University regulations, no more than 12 credits completed prior to matriculation or in summer sessions at other accredited colleges or universities may be accepted. Transfer students are not subject to this restriction. They must obtain credit for courses they wish to transfer during their first year at Hopkins. University regulations also require a minimum of two years' residence for a Hopkins degree.

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Advanced Placement

Johns Hopkins University grants credit for many Advanced Placement (AP) examinations. If you took AP exams, please have your scores sent to Johns Hopkins University as soon as possible. AP scores will be entered on your academic record upon receipt. The Whiting School's Office of Academic Affairs (located in Shaffer 103) decides what AP credits can be counted toward an engineering degree. Please visit the link below if you have questions about your AP credits:

<http://engineering.jhu.edu/academic-advising/>

CHEMISTRY: A score of four or five on the AP Chemistry exam exempts a student from taking the Intro Chemistry I and II sequence (030.101, 030.102). In that case, Chemistry Lab is waived.

PHYSICS: A score of four or five on Physics C (parts one and two) exempts a student from the Physics I and II sequence (171.101, 171.102), **but the corresponding Physics Labs (173.111, 173.112) are required.** No AP credit is awarded for Physics B. For additional information about AP credits, please consult your Engineering 101 Program Planning Guide provided by the Whiting School of Engineering.

ENVIRONMENTAL ENGINEERING MAJOR CURRICULUM

Our Mission

The mission of the environmental engineering undergraduate program is to provide students a broadly based yet rigorous education in the fundamental subjects central to the field, in a milieu that fosters a spirit of intellectual inquiry and the development of problem-solving skills required to address the open-ended issues characteristic of environmental engineering problems. The fundamental subjects include the physical, chemical, biological, and social sciences; mathematics; engineering science; the principles of environmental engineering; and the art and science of engineering design. This training is meant to prepare students for future employment as professional engineers, and for subsequent training at the graduate level, either in Environmental Engineering, other engineering and scientific fields, or professions such as business, law, public health, and medicine.

Educational Objectives

The undergraduate environmental engineering program is designed to produce environmental engineering graduates who:

- Understand the principles upon which engineering practice is based, including mathematics and scientific computation; engineering science; and relevant principles of the physical, chemical, biological, and social sciences;
- Have knowledge and skills to design, conduct, and evaluate experiments;

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- Understand the need for multidisciplinary approaches to engineering solutions to environmental problems, and the cross-media (air, water, soil) nature of environmental problems, and have a practical understanding of the social nature of environmental problems and their potential engineering solutions;
- Demonstrate critical thinking skills and an ability for independent study needed to engage in life-long learning;
- Possess knowledge and skills to identify, formulate, and implement solutions to engineering problems using modern engineering tools and synthesizing different fields of knowledge;
- Can communicate effectively both orally and in writing, and collaborate in multidisciplinary teams;
- Are broadly educated to understand contemporary issues and the policy context in which environmental engineering is practiced in modern society;
- Have access to specialized training through coursework and research; and
- Understand professional ethics and the value of service through participation in technical activities and in professional organizations.

Environmental Engineering Curriculum

With the assistance of a faculty advisor, each student will plan a curriculum suited to his or her ultimate career goals. The program also encourages individual study and research. The program of study we have designed satisfies the Accreditation Board for Engineering and Technology (ABET) criteria, and we are an ABET approved program. Advanced training through participation in a senior design project involves synthesizing information from more than one field to solve real-world problems.

The Environmental Engineering curriculum is structured as follows, and involves a total of 124 credits:

Mathematics (M) with a focus on applications (19 credits)

Required Courses:

- 110.108 Calculus I (Physical Sciences and Engineering)
- 110.109 Calculus II (Physical Sciences and Engineering)
- 110.202 Calculus III (Physical Sciences and Engineering) or 110.211 Honors
Multivariable Calculus and Linear Algebra
- 550.291 Linear Algebra and Differential Equations or 110.302 Differential
Equations with Applications
- A course in probability and statistics (The Department of Applied Mathematics and
Statistics offers a number of suitable courses)

Basic Science (BS) (24-25 credits)

Required Courses:

- 171.101 General Physics for Physical Science Majors I
- 171.102 General Physics for Physical Science Majors II
- 173.111 General Physics Laboratory I

173.112 General Physics Laboratory II

One year of introductory chemistry (e.g., 030.101 Introductory Chemistry I and 030.102 Introductory Chemistry II)

030.105 Introductory Chemistry Laboratory I

030.106 Introductory Chemistry Laboratory II

570.205 Ecology

An additional course in the biological sciences, such as 020.151 General Biology I, or 570.328 Geography and Ecology of Plants.

Note: Premedical students could substitute 020.305 Biochemistry, 020.315 Biochemistry Laboratory, 020.306 Cell Biology, and 020.316 Cell Biology Laboratory, for Ecology or General Biology. Premedical students should also take additional chemistry courses as electives, such as 030.205 Introductory Organic Chemistry I, 030.206 Introductory Organic Chemistry II, and 030.225 Organic Chemistry Laboratory.

Humanities and Social Sciences (HS) (18 credits)

A minimum of six courses (each of at least three credits) in Humanities or Social Sciences (catalog code H or S) with at least two courses at the 300 level or higher. Note that 570.334 Engineering Microeconomics can be counted toward these 18 credits. It is strongly recommended that 570.404, 570.406, and/or 570.465 be taken as part of these requirements. There is also a University writing requirement of at least two courses. Note also that most medical schools require a year of English literature and/or composition.

Required course:

570.334 Engineering Microeconomics

Additional elective examples:

570.406 Environmental History

570.427 Natural Resources, Society, and Environment

570.465 Water Resource Development: History and Principles

General Engineering (GE) (16 credits)***Required courses:***

570.108 Introduction to Environmental Engineering

An introductory course in computing (570.210, Introduction to Computation and Mathematical Modeling or an equivalent course)

A course in thermodynamics (e.g., 540.203 Engineering Thermodynamics)

A course in Statics (either 560.201 Statics and Mechanics of Materials, or 530.201 Statics and Mechanics of Materials)

570.351 Introduction to Fluid Mechanics

Design Experience and Engineering Laboratory (D) (9 credits)***Required courses:***

570.305 Environmental Engineering Systems Design
570.419, 570.421 Environmental Engineering Design I, II

The Design and Synthesis sequence is a five-credit project course (2 credits fall semester, 3 credits spring semester) and involves a comprehensive study of the engineering design process from problem definition to final design. The course involves team projects that include written and oral presentations. Students will form small teams that will work with local companies or government agencies in executing the project. Prerequisite: senior standing in Environmental Engineering.

Environmental Engineering Requirements (EER) (26 credits)

Required courses (14 credits):

570.239 Current and Emerging Environmental Issues
570.301 Environmental Engineering I: Fundamentals
570.302 Environmental Engineering II: Water and Wastewater Treatment
570.304 Environmental Engineering and Science Laboratory
570.353 Hydrology

Environmental Engineering Electives (EEE) (12 credits):

Students take at least two courses from one of the following focus areas, and at least one course from two of the other focus areas. Courses to be selected in consultation with advisor. Any changes in courses must be approved by the advisor. These courses will include numerous open-ended problems.

(a) Environmental Management and Economics (Note: 600 level courses require permission of instructor)

570.496 Optimization Models in Environmental Systems
570.497 Risk & Decision Analysis
570.418/618 Multiobjective Programming and Planning
570.608 Uncertainty Modeling for Policy and Management Decision Making
570.659 Environmental Policy Analysis
Please check with your advisor for any additional courses.

(b) Environmental Engineering Science

570.411 Engineering Microbiology
570.443 Aquatic Chemistry
570.442 Environmental Organic Chemistry

(c) Environmental Transport

530.328 Fluid Mechanics II
570.432 Sediment Transport and River Mechanics
570.424 Air Pollution

(d) Environmental Health Engineering

570.600 Engineering Aspects of Public Health Crises

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182.625 Principles of Industrial Hygiene*
 187.610 Principles of Toxicology*
 340.601 Principles of Epidemiology*

Technical Electives (TE) (minimum of 12 credits) (selected in consultation with an advisor)

At least three (E), (Q) or (N) courses at or above the 300 level totaling at least twelve credits. (For ABET requirements at least one from: Solid Waste; Hazardous Waste; Air Pollution; Environmental Health Engineering, if not satisfied as part of the Environmental Engineering electives.) Up to six credits of independent study or research may be applied toward engineering requirements (e.g., 570.509 Independent Study, or 570.509 Senior Thesis). Note earlier comments for premed majors.

It is strongly recommended that students take additional advanced classes in computing and numerical methods. Environmental Engineering Science students are strongly encouraged to take at least one course in organic chemistry (e.g., 030.205 Introductory Organic Chemistry I), which, however, would not count towards the TE 300 level requirement.

* These courses are offered on the Bloomberg School of Public Health campus.

Sample Environmental Engineering Program

This program satisfies the Environmental Engineering BS with a concentration area in environmental engineering science. This program is based on the assumption that students have not previously completed A.P. courses in Calculus, Physics, Chemistry, etc.

First year

Semester 1

110.108 Calculus I (Physical Sciences and Engineering)	4 (M)
030.101 Introductory Chemistry I	3 (BS)
030.105 Introductory Chemistry Laboratory I	1 (BS)
H/S Elective 1	
570.108 Introduction to Environmental Engineering	3 (GE)
Total	14

Semester 2

110.109 Calculus II (Physical Sciences and Engineering)	4 (M)
030.102 Introductory Chemistry II	3 (BS)
030.106 Introductory Chemistry Laboratory II	1 (BS)
H/S Elective 2	3 (HS)
570.210 Intro. to Computation and Math. Modeling	3 (GE)
Total	14 (Annual 28)

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Second year

Semester 1

560.201 Statics and Mechanics of Materials	4 (GE)
171.101 General Physics for Physical Science Majors I	4 (BS)
173.111 General Physics Laboratory I	1 (BS)
570.205 Ecology	3 (BS)
550.291 Linear Algebra and Differential Equations	4 (M)

Total	16
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Semester 2

570.239 Current and Emerging Environmental Issues	3 (EER)
110.202 Calculus III (Calculus of Several Variables)	4 (M)
171.103 General Physics for Physical Science Majors II	4 (BS)
173.112 General Physics Laboratory II	1 (BS)
H/S elective 3	3 (HS)

Total	15 (Annual 31)
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Third year

Semester 1

570.305 Environmental Engineering Systems Design	4 (D)
570.334 Engineering Microeconomics	3 (HS elective 4)
570.301 Environmental Engineering I: Fundamentals	3 (EER)
570.351 Introduction to Fluid Mechanics	3 (GE)
530.231 Mechanical Engineering Thermodynamics	3 (GE)

Total	16
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Semester 2

570.302 Environmental Engineering II	3 (EER)
570.304 Environmental Engineering and Science Lab. Probability/Statistics course	2 (EER) 3 (M)
570.406 Environmental History	3 (HS elective 5)
570.328 Geography and Ecology of Plants	3 (BS)
570.353 Hydrology	3 (EER)

Total	17 (Annual 33)
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Fourth year

Semester 1

570.419 Environmental Engineering Design I	2 (D)
570.442 Environmental Organic Chemistry	3 (EEE-conc)
570.443 Aquatic Chemistry	3 (EEE-conc)

570.424 Air Pollution	3 (TE)
570.644 Dynamic Environmental Systems and Decision Making	3 (EEE-conc)
Total	17
Semester 2	
570.421 Environmental Engineering Design II	3 (D)
570.432 Sediment Transport and River Mechanics	3 (EEE)
530.328 Fluid Mechanics II	3 (TE)
H/S elective 6	3 (HS)
570.491 Hazardous Waste Management	3 (TE)
Total	15 (Annual 32)

Math (M) = 19 credits; Humanities and Social Sciences (HS) = 18 credits; Basic Science (BS) = 24 credits; General Engineering (GE) = 16 credits; Environmental Engineering Requirement (EER) = 14 credits; Environmental Engineering Electives (EEE) = 12 credits; Technical Electives (TE) = 12 credits; Design (D) = 9 credits; **Total Credits = 124**

HUMANITIES AND SOCIAL SCIENCE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING MAJORS

The Humanities and Social Sciences play an important role in an individual's education. The Whiting School of Engineering requires a minimum of six courses (each of at least three credits) in Humanities or Social Sciences (catalog code H or S).

Students taking elements of a foreign language are granted an H area designator for both semesters only if the second semester course is successfully completed (see the Johns Hopkins Catalog, page 43). For example, a student successfully completing 090.101 and 090.102 *Elementary German* would get 8 H credits. (Note that while four H credits are given for 090.102 alone, no H credits are given for 090.101 alone).

Writing Requirement

Since competence in written communication is essential for an engineering graduate, students must take at least two courses that specifically develop writing skills. Although this course must also be designated as a writing intensive course (catalog code W), this designation is not sufficient to guarantee the desirable level of intensity in writing instruction. Three courses that do satisfy this requirement are: 060.113 *Practical Composition*; 220.105 *Introduction to Fiction and Poetry Writing*; and 661.110 *Technical Communication*. Students wishing to use any other course to satisfy this writing requirement must have written permission from their advisor.

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Economics Requirement

To help the student gain an appreciation of the broad economic context in which he/she will operate, one calculus-based introductory course in economics, 570.334 *Engineering Microeconomics*, is required.

Distribution and Depth Requirements

Although not directly related to the major field of study, the Humanities and Social Science portion of the program is also of great importance in broadening the student's education and in stimulating the development of an inquisitive and critical mind. In order to best attain these objectives, the free electives in Humanities and Social Science courses must be chosen as a coherent group in two (and only two) areas of concentration, with at least two courses per group. Examples of areas are listed below. Note that these are examples only; other areas of concentration are certainly possible. Environmental engineering majors are strongly encouraged to consider taking 570.404, 570.406, and/or 570.465 as part of these requirements.

- Ancient, Classical, Medieval and Renaissance studies
- Eighteenth, Nineteenth, and Twentieth Century studies
- Latin American, Asian, and African Studies
- History and Philosophy of Science
- Moral and Political Philosophy
- Literature and Languages
- History of Art or Music
- Psychology
- Sociology
- Anthropology
- Political Institutions
- Economics
- Environment and Society (DoGEE)

To obtain sufficient depth in the Humanities and Social Sciences, Departmental regulations require that at least 6 H/S credits (two courses; one in each area of concentration) are obtained at the 300 level or higher. With the approval of the student's advisor, intermediate level language courses may be taken to satisfy this depth requirement. Note that the Whiting School (and the Department) allow the first two semesters of any elementary course in a foreign language to count toward the fulfillment of the H/S requirement as long as both semesters are successfully completed.

Summary

In summary, the Environmental Engineering program requires a minimum of six full courses (18 credits) in Humanities and Social Sciences, one writing course (as defined above), one course in economics (570.334), and two courses at the 300 level or above. The free electives must be from two concentrations (at least two courses each).

DOUBLE-MAJORS AND MINORS

Information for Environmental Engineering Majors

Environmental Engineering majors may elect to double-major or to complete a minor from any department in the School of Engineering or the School of Arts and Sciences that offers one.

Students wishing to pursue a double major should inform the Whiting School's Office of Academic Advising. It is the student's responsibility to ensure that all appropriate requirements are met (it is recommended that a faculty advisor from each major be asked to sign off on the student's planned academic program). Students wishing to pursue a minor should confer with the department through which the minor is offered to ascertain the exact requirements.

The minor in Entrepreneurship and Management focuses on business and management from a multidisciplinary viewpoint and is designed to provide Hopkins engineering students with the knowledge and skills to become leaders in technology companies. Students interested in the Entrepreneurship and Management minor should contact Professor Andrew Douglas (douglas@jhu.edu) or Kristen Kelley (kkelley@jhu.edu) for more information. More traditional subspecialty minors are available through the departments of Civil Engineering, Computer Science, and Applied Mathematics and Statistics.

The Environmental Engineering Minor

Environmental engineering has become an important part of engineering practice in most engineering fields and across a professional spectrum from the private sector through governmental agencies to academia. An undergraduate minor in environmental engineering has been established to enable engineering students to pursue an interest in this field and to incorporate aspects of environmental engineering into their own careers in other engineering disciplines. Students in any undergraduate engineering major in the GWC Whiting School of Engineering are eligible for admission to the program, which is administered through the Department of Geography and Environmental Engineering (DoGEE). Students in undergraduate majors other than engineering can enroll in the Environmental Science minor, also offered by the Department of Geography and Environmental Engineering.

Each student in the Environmental Engineering Minor program will be assigned an advisor in the Department of Geography and Environmental Engineering to work with them in developing a program that meets the requirements for the minor that is consistent with the educational requirements of their major field of engineering study. Requirements of the Minor Program consist of (1) a set of "core" science and mathematics courses, already common to the civil and chemical engineering majors, (2) four required courses (total of 11 credits) in environmental engineering, and (3) two elective courses, one of which is taken at the freshman or sophomore level and the other of which is taken at the junior or senior level. Lists of the core courses, required courses, and approved elective courses are provided subsequently. Other electives may be considered, but are subject to specific approval by the minor advisor.

Students with a strong interest in Environmental Engineering may also wish to consider the Whiting School's Honors B.S./M.S.E. Program. Under this program, outstanding students completing ABET-accredited B.S. programs in engineering disciplines can apply for direct continuation into the M.S.E. Program in Environmental Engineering, which is administered by the Department of Geography and Environmental Engineering.

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Below are the course requirements for the Environmental Engineering Minor. For further information, contact: Dr. William P. Ball, Coordinator, 301 Ames Hall (DoGEE).

CORE COURSES (advanced placement credits and/or equivalent courses in other schools or departments are acceptable, subject to advisor approval)

110.108 Calculus I	4 credits
110.109 Calculus II	4
110.202 Calculus III	4
550.291 Linear Algebra and Differential Equations	4
030.101 Introductory Chemistry I	3
030.102 Introductory Chemistry II	3
030.105 Introductory Chemistry Laboratory	1
030.106 Introductory Chemistry Laboratory	1
171.101 General Physics I	4
171.102 General Physics II	4
173.111 General Physics Laboratory	1
173.112 General Physics Laboratory	1

CURRICULUM (a total of 18 credits is required)

Required Courses (total of 12 credits)

570.301 (N,E), Environmental Engineering I-Fundamentals, 3 credits, fall

570.302 (N,E), Environmental Engineering II -Water and Wastewater Treatment, 3 credits, spring

570.304 (N,E), Environmental Engineering and Science Laboratory, 2 credits, spring

570.305 (N,E), Environmental Engineering Systems Design, 4 credits, fall

Elective Courses (total of 6 credits). One course from each of two groups is required.

Group A** - Introductory courses at the freshman and sophomore level. One course required.*

570.108	Introduction to Environmental Engineering
570.205	Ecology
570.239	Current and Emerging Environmental Issues
570.317	Paleoecology
570.328	Geography and Ecology of Plants
020.151	General Biology I

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270.220	The Dynamic Earth: An Introduction to Geology
500.111	Energy and the Environment

Group B** - Engineering science courses that are developed for juniors and seniors, and also introductory graduate level courses. One course required. Double counting of these courses with specified required courses in the student's major is not allowed.

270.320	The Environment and your Health
570.353	Hydrology
570.411	Engineering Microbiology
570.420	Mechanics for Earth and Environmental Science
570.423	Principles of Geomorphology
570.431	Open Channel Hydraulics
570.432	Sediment Transport and River Mechanics
570.442	Environmental Organic Chemistry
570.443	Aquatic Chemistry
570.444	Colloid Chemistry
570.445	Physical/Chemical Processes in Environmental Engineering I
570.446	Biological Processes for Water and Wastewater Treatment
570.491	Hazardous Waste Management
030.201	Intermediate Organic Chemistry
030.204	Intermediate Chemistry
030.301	Physical Chemistry I
270.369	Introduction to Geochemistry
270.401	Geochemical Kinetics
270.410	Global Climate Change: Introduction
540.301	Chemical Kinetics and Reactor Design
540.303	Transport Phenomena I
550.310	Introduction to Probability and Statistics
560.435	Probability and Statistics in Civil Engineering

*Substitution for one required course may be possible under special circumstances, with explicit approval of the environmental engineering minor advisor.

**Additional course electives are possible but require approval of the environmental engineering minor advisor.

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THE CONCURRENT 5-YEAR BACHELOR'S/MASTER'S PROGRAM

The Department of Geography and Environmental Engineering offers a concurrent five-year B.S./M.S. and B.S./M.S.E. program. While the department still strongly prefers applications to be received by the end of the fall semester of the junior year, we will consider applications received later.

To apply for admission, the student must submit an online application at <http://gradadmin.as.jhu.edu/graduateapplication/default.cfm>. In addition, the student will need to present a statement of purpose, three letters of recommendation, and college transcripts.

Upon acceptance into the program, students will be asked to develop an outline of their proposed academic program with their advisor. Please contact your advisor if you have questions or would like to consider application to the program.

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FREQUENCY OF COURSE OFFERINGS

Some courses are offered exclusively in specific semesters, and sometimes in alternating years. Below is the standard timeframe of course offerings. **These offerings are subject to change without notice, and future “next offered” dates are tentative.** Please confirm these offerings with your advisor when planning your course schedule. Please consult with your advisor for intervals of courses not listed here.

Graduate courses (570.6xx), which are not shown below, can be taken by seniors with permission of the instructor.

COURSE	INTERVAL OF OFFER	NEXT OFFERED
570.108 Introduction to Environmental Engineering	Fall/Summer	Fall 2009
570.109 Environment and Society: Towards Sustainability		Fall 2009
570.205 Ecology	Fall	Fall 2009
570.210 Introduction to Computation/Mathematical Modeling	Spring	Spring 2010
570.239 Current and Emerging Environmental Issues	Spring	Spring 2010
570.301 Environmental Engineering I: Fundamentals	Fall	Fall 2009
570.302 Environmental Engineering II: Water/Wastewater	Spring	Spring 2010
570.304 Environmental Engineering and Science Lab	Spring	Spring 2010
570.305 Environmental Engineering Systems Design	Fall	Fall 2009
570.317 Paleoecology	Spring/Alt Yrs	
570.328 Geography and Ecology of Plants	Spring	Spring 2010
570.334 Engineering Microeconomics	Fall	Fall 2009
570.353 Hydrology	Fall	Spring 2010
570.395 Principles of Estuarine Environment	Fall/Alt Yrs	Fall 2009
570.404 Political Ecology		Fall 2009
570.406 Environmental History	Spring	
570.409 Facility Siting Models	Fall/Alt Yrs	
570.419 Environmental Engineering Design I	Fall	Fall 2009
570.420 Mechanics for Earth and Environment Science	Fall	
570.421 Environmental Engineering Design II	Spring	Spring 2010
570.423 Principles of Geomorphology	Spring	Spring 2010
570.424 Air Pollution	Spring/Alt Yrs	
570.427 Natural Resources, Society, and Environment	Fall	
570.429 Surface Effects in Technological Processes/Materials	Fall	

570.431 Open-Channel Hydraulics	Spring/Alt yrs	
570.432 Sediment Transport and River Mechanics	Spring/Alt Yrs	
570.441 Environmental Inorganic Chemistry	Spring/Alt Yrs	Spring 2010
570.442 Environmental Organic Chemistry	Fall	Fall 2009
570.443 Aquatic Chemistry	Fall	Fall 2009
570.444 Colloid Chemistry	Spring	?
570.445 Physical/Chemical Processes for Water and Wastewater Treatment	Fall	Fall 2009
570.446 Biological Processes for Wastewater Treatment	Spring	Spring 2010
570.448 Physical/Chemical Processes in Environmental Engineering II	Spring	Spring 2010
570.452 Exper. Methods in Environmental Engineering and Chemistry	Spring	Spring 2010
570.465 Water Resource Development: History and Principles	Fall	Fall 2009
570.470 Applied Economics and Finance		Fall 2009
570.487 Futures Market Research		Fall 2009
570.490 Solid Waste Engineering Management	Fall	Fall 2009
570.491 Hazardous Waste Management	Spring	Spring 2010
570.492 Department Seminar		Fall 2009
570.493 Economic Foundations for Public Decision Making	Fall	Fall 2009
570.494 Ecosystem Management Models	Fall	
570.495 Mathematical Foundations for Public Decision Making	Fall	Fall 2009
570.496 Optimization Models in Environmental Systems	Spring/Alt Yrs	Spring 2010
570.497 Risk and Decision Analysis	Fall	Fall 2009
570.501 Undergraduate Research		Fall 2009
570.505 Independent Study		Fall 2009

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ENVIRONMENTAL ENGINEERING CHECKOUT SHEET (2009-2010)

Student: _____

Class of: _____ **Advisor:** _____

		Cred	Grde	Sem			Cred	Grde	Sem
	Basic Science					Required Env. Eng.			
171.101	General Physics I	4			570.221	Current/Emerg Env Issues	3		
173.111	General Physics Lab. I	1			570.301	Env Eng I: Fundamentals	3		
171.102	General Physics II	4			570.302	Env Eng II: Water/Wastew.	3		
173.112	General Physics Lab. II	1			570.304	Env Eng and Science Lab	2		
030.101	Intro Chemistry I	3			570.353	Hydrology	3		
030.105	Intro Chemistry Lab I	1							
030.102	Intro Chemistry II	3					14		
030.106	Intro Chemistry Lab II	1				Env. Eng. Electives			
570.205	Ecology	3					3		
		3					3		
							3		
		24-25					3		
	Mathematics								
110.108	Calculus I	4					12		
110.109	Calculus II	4				Technical Electives			
110.202	Calculus III	4					3		
550.291	LA/DE	4					3		
____.3__	Statistics	3					3		
							3		
		19							
	H & S Electives						12		
570.334	Engineering Microecon.	3				General Engineering			
	Writing	3					3		
		3					3		
		3					3		
____.3__		3					3		
____.3__		3					4		
		18					16		
	Design Exp/Eng Lab								
570.305	Env Eng Systems Design	4							
570.419	Design/Synth in Env Eng I	1							
570.421	Design/Synth in Env Eng II	3							
		8							

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(updated 8/25/09)

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Class of	Advisor
2013	Edward Bouwer
2012	Seth Guikema and Kai Loon Chen
2011	Bill Ball and Markus Hilpert
2010	Ben Hobbs and Catherine Norman

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