



# Water Quality Technology and Hazardous Materials Management

Department of Environmental Studies and Planning  
Sonoma State University-RCH 13

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The Department of Environmental Studies and Planning at Sonoma State University offers a program in Water Quality Technology and Hazardous Materials Management for students seeking employment in industry, private consulting firms, government regulatory agencies, and governmental agencies which treat drinking water, waste water, solid waste, and hazardous waste.

The program is broadly based to prepare students for careers in all aspects of public health and water quality. The students take courses from many different departments on our campus including microbiology and toxicology from the Biology Department, hydrology from the Geology Department, and lots of chemistry. They take math and computer science. They also have many courses in environmental science in their home department, ENSP. The students have their choice of taking a Bachelor of Arts or a Bachelor of Science. The B.S. students take more science and math courses, including physics and a year of calculus. The B.A. students take one semester of computer science; the B.S. students take two semesters. If students start taking the B.S. program when they are freshmen or sophomores, they can graduate in four years, but if they enter the program as juniors, it often takes them an extra year to get all the science courses needed for the B.S.

Originally, we had only a B.A. program, and some graduates told us that they felt they had trouble finding work, because they were not Bachelors of Science. We have now had about a decade to watch the graduates, and we have observed that the B.S. and B.A. students find work at the same rate and take similar jobs. The best reason to take the B.S. program is because it provides an even better scientific foundation, which helps the graduates understand the environmental problems which cause hazardous materials to be released that contaminate people and cause water and soil pollution. The classes in calculus and physics are especially helpful because our graduates work with engineers who often think and express themselves in calculus. A small set of new regulatory positions in state and local government are only open to B.S. graduates.

The largest number of jobs available to our graduates are as wastewater or drinking water operators. There is a serious shortage of these people in the U.S. today. The jobs are well paid, have good benefits, they are interesting, and they are important for

environmental quality. We have many graduates who do this work and one of the good things about it is that there is room for advancement without going to graduate school, by learning on the job and taking correspondence courses.

Our graduates in the past have been most interested in working as investigators for federal, state, regional, and local environmental agencies. We have had a few graduates work for the USEPA and a few for California EPA. Many work for the Regional Water Quality Control Boards in California. All of these positions are open to people with a bachelors of science degree. We also have graduates who work for county and city environmental health departments, which generally require a year of graduate study at a university which has a school of public health. A small but growing group of graduates work for cities as industrial wastewater inspectors, insuring that toxic materials are not put into the public sewers. We have graduates who are uniformed fire officials who make sure that every factory or agency which handles toxic or explosive materials has good practices to avoid problems and reliable plans if something goes wrong.

A small group of our graduates work for medium and large corporations. Some of them operate the machinery which purifies the air and wastewater from industrial pollutants. Others work as in house health and safety officers. Still others are environmental compliance managers who make sure that the company is obeying all of the environmental laws, and who manage the hazardous materials at the factory. We have had two graduates who worked for the General Accounting Office of the U.S. Congress, which does detective work to see how the federal laws are being followed and how the federal funds are being used.

We also have a number of graduates who work in small engineering firms which serve the public agencies and the large private corporations. Some of these firms specialize in cleaning up polluted water and soil. Others give technical advice. For example we had a graduate who travels around the US giving advice to small, impoverished towns and Indian reservations about how to purify their drinking and wastewater. Some firms do the same kinds of inspections as the regulatory agencies but without fines. The opportunities available to graduates of this program are varied indeed.

**Check our website: [www.sonoma.edu/ensp](http://www.sonoma.edu/ensp)**

**Other ENSP Study Plans** include Education and the Environment •  
Energy Management and Design • Environmental Conservation & Restoration •  
Outdoor Leadership • Planning Concentration

# WATER QUALITY HAZARDOUS MATERIALS MANAGEMENT STUDY PLAN

## B.A. Degree

### **CORE COURSES** (all required)

CHEM 115A&B*	General Chemistry	5,5
ENSP 200*	Global Environmental Issues	3
ENSP 201	Environmental Forum	1
ENSP 350	Hazardous Materials Mgmt.	3
ENSP 404	Environmental Law	3
ENSP 450	Water Technology	3
ENSP 451	Water Regulation	3
ENSP 499	Internship	4
GEOLOGY 323	Hydrology	3
BIOL 308*	Environmental Toxicology	3

### **REQUIRED SUPPORT COURSES**

At least one course from each of the following areas

#### **GROUP A: Microbiology**

BIOL 240	General Microbiology	4
BIOL 338	Environmental Microbiology and Biotechnology	4

#### **GROUP B: Earth Science**

ENSP 303	Applied Physical Science	4
ENSP 309	Soil Science	4
GEOLOGY 303*	Adv. Principles of Geology	4
GEOLOGY 306	Environmental Geology	3

#### **GROUP C: Computer Apps.**

ENSP 403	Computer Modeling	3
CS 101*	Intro. to Comp. & Computing	3
BUSI 319	Intro. to Mgmt. Info. Systems	4

#### **GROUP D: Statistics**

BUSI 211	Business Statistics	4
MATH 165*	Elementary Statistics	4

#### **GROUP E: Social Science Perspectives**

ENSP 310	Introduction to Planning	3
ENSP 315	Environ. Impact Reporting	3
ENSP 401	Environmental Policy	4
ENSP 416	Environmental Planning	3
ENSP 418	Planning for Sustainable Comm.	3

#### **GROUP F: Humanistic Perspectives**

ENSP 306	Environmental Ethics	3
ENSP 307	Environmental History	4
ENSP 308	Environmental Literature	3
ENSP 314	Urban Design I: Placemaking	3
ENSP 421	Landscape History of the American West	3

\*Courses which also satisfy university-wide General Education (G.E.) requirements are marked with a G. Courses for which there are prerequisites are marked with a P. In many cases the prerequisites will be waived for students in our program. Many students in these B.A. programs take a minor or double major in Chemistry or Geology. A minor at SSU usually requires 20 units. Students may consult an academic advisor in Chemistry or Geology for details.

## B.S. Degree

<b>Total for Degree:</b>	<b>120 units</b>
Natural Science Support Courses	31 units
Environmental Requirements	37 units
Degree Coursework that meets GE	12 units

### **Natural Science Support Courses (31 units)**

BIOL 308*	Environmental Toxicology	3
CS 101*	Intro. to Computers & Computing	3
CHEM 115A*&B	General Chemistry	10
GEOLOGY 323	Hydrology	3
MATH 161*	Calculus I	4
MATH 165*	Elementary Statistics	4
MATH 211-S	Calculus II	2
PHYS 210A*,B	General Physics	6

### **ENSP Courses (33 or 34 units) all of the following:**

ENSP 200*	Global Environmental Issues	3
ENSP 201	Environmental Forum	1
ENSP 350	Hazardous Materials Mgmt.	3
ENSP 403	Computer Modeling	3
ENSP 404	Environmental Law	3
ENSP 499	Internship	3

At least one course from Group A on the left

At least two courses from Group B on the left

At least one course from Group E on the left

### **Required courses for Water Quality emphasis only**

P	ENSP 450	Water Technology	3
	ENSP 451	Water Regulation	3

### **Required for the Hazardous Materials emphasis only**

CHEM 335A	Organic Chemistry	5
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\*Course work which meets General Education Requirements.

All students must take at least 24 ENSP units to complete this study plan and 40 units of upper division coursework from any department.

Revised: 9/22/2011