

MASTER OF SCIENCE **IN** **ENVIRONMENTAL SCIENCE**^[1]

Washington State University Tri-Cities
2710 University Drive
Richland, WA 99354-1671

A Master of Science degree program in environmental science was initiated in 1990 on the Tri-Cities campus of Washington State University (WSU). The Environmental Science Program is administered by the School of Earth and Environmental Science (SEES). The Program was established on the Pullman campus in 1968 to provide students an opportunity to earn an interdisciplinary degree that will enable them to better understand and manage the full scope of environmental issues.

The Environmental Science Program on the WSU Tri-Cities campus was developed to provide the same opportunities to students in the Mid-Columbia Basin. The Program is intended to provide students with an interdisciplinary, applications-oriented education in environmental science. It is designed to provide an instructional background that will enable graduates to utilize a scientific approach to study natural ecological processes and to address current and future regional and/or worldwide environmentally related issues. The goal of the Program is to provide an educational background so that graduates will:

- have a basic understanding of the behavior and interactions of the physical, chemical, and biological components of the environment,
- be knowledgeable about historical perspectives of human's interactions with the environment,
- have the relevant laboratory, field, and other professional skills necessary to address environmental issues,
- be resources of information and, likewise, also know when and where to get additional assistance to help address complex environmental issues,
- be knowledgeable about environmental regulations, safety requirements, and related issues,
- be knowledgeable about pathway analysis, environmental toxicology, and risk assessment,
- be able to communicate with the public as well as with technical peers,
- serve as interfaces with engineers and other environmental specialists, and
- address environmental problems with a rational and ecologically sound approach.

AREAS OF SPECIALIZATION

Students may specialize in one of five technical areas or pursue an option that provides a general overview of various components of the primary technical areas. The areas of specialization are:

- I. Applied Environmental Science - provides the opportunity for students to develop a broad understanding of environmental science.

^[1] If you have questions regarding the Environmental Science Program, please contact the Academic Program Coordinator at WSU Tri-Cities, Dr. R. Gene Schreckhise, at 509-372-7323 or the Academic Advisor, Ms. Carol Coker, at 509-372-7306. You may also contact the School of Earth and Environmental Science in Pullman at 509-335-8538. The mailing address is Troy Hall, Washington State University, Pullman, WA 99164-4430. For information about applying to the Program, contact the WSU Tri-Cities' Admissions and Registration Office at 509-372-7250.

- II. Earth Science - includes such technical areas as the interfaces among environmental media; ecology of the surface and subsurface environments; movement of ground water; behavior and transport of natural constituents and contaminants in ground water; the management and disposal of hazardous material from industrial, agriculture and other sources; performance assessment; site remediation; and many aspects of agriculture science.
- III. Environmental and Occupational Health Science - provides an understanding of the potential impacts of industry and other sources of pollutants on the health of individuals and communities (i.e., biota including humans) in the natural environment. Also addresses the health of people in the workplace. It includes such topics as environmental and occupational health physics, and industrial hygiene.
- IV. Environmental Regulatory Compliance - provides a basic knowledge of environmental sciences along with an understanding of environmental regulations and their environmental significance. The technical basis of the regulations will also be presented to help prepare the students to remain current on ever-changing environmental regulations.
- V. Environmental Toxicology and Risk Assessment - provides an understanding of the basic principles of environmental toxicology. The technical bases for using toxicological and other related information to conduct environmental and health risk assessments are also presented.
- VI. Water Resource Science - provides an understanding of watershed hydrology; the ecology of watersheds, rivers, lakes, estuarine systems, and oceans; and the water quality of rivers and lakes.

APPLICATION TO THE PROGRAM

The WSU Tri-Cities' Admissions and Registration office should be contacted to obtain precise directions on initiating application to the Program. Applications for admission into the Program must include:

- a one- or two-page statement of goals, explaining why the applicant wishes to pursue graduate studies in environmental science and what expectations the applicant has of the Program – it must be submitted to the SEES Office^[2],
- two official copies of transcripts from all colleges and/or universities attended – one copy to the WSU Graduate School^[3] and another copy to the SEES Office^[2],
- three letters of recommendation to the SEES Office^[2], and
- completed online form at “<http://gradschool.wsu.edu/future-students/admission/apply.html>” for admission to WSU's Graduate School.

Be advised that because of limitations of faculty and facilities, it may be necessary to deny admission to some qualified applicants.

UNDERGRADUATE REQUIREMENTS

A baccalaureate degree from a college or university accredited by a recognized accrediting association is required. The degree should be in life, physical, or chemical sciences, engineering, or an equivalent area of study. Successful completion of the college-level courses listed below is required for admission into

^[2] School of Earth and Environmental Science, Washington State University, Troy Hall, Pullman, WA 99164-4430.

^[3] Graduate School, Washington State University, French Administration, Pullman, WA 99164-1030.

the Program without deficiencies. These requirements may be augmented to compensate for undergraduate deficiencies.

- basic course in environmental science (3 semester credits),
- biological sciences (3 semester credits),
- calculus or statistics (3 semester credits),
- general ecology (4 semester credits),
- general chemistry or general physics (6 semester credits), and
- sociology or cultural anthropology (3 semester credits).

Students can be admitted into the Program with deficiencies if all of the above courses have not been completed. However, the deficiencies must be removed by successfully completing suitable courses before the student can graduate. None of the courses taken to remove deficiencies may count as part of the student's graduate program.

STUDENT STATUS CLASSIFICATIONS

The following student status classifications are for students who wish admission to the Program and Graduate School.

REGULAR ADMISSION

A student must complete the entire application process (i.e., statement of goals, transcripts, letters of recommendation, and Graduate School application form) and possess a minimum grade point average (GPA) of 3.0 (i.e., based on a 4.0 system) for consideration for regular admission into the Program and the Graduate School. Calculation of the GPA can be based on:

1. the last 60 semester or 90 quarter credits of undergraduate work (i.e., primarily junior- and senior-level courses),
2. 12 semester or 18 quarter credits of graded graduate work, or
3. the total graded graduate work from another accredited graduate school(s) provided that at least 12 semester or 18 quarter credits were taken.

PROVISIONAL ADMISSION

A limited number of provisional admissions may be granted to applicants who do not meet the GPA requirement and/or have not completed the entire application process, provided that the student's total record indicates a high probability of success in the Program. Criteria that may be used to consider an applicant for provisional admission include:

- letters of recommendation from persons qualified to evaluate the applicant's academic record and potential,
- a record of successful work experience and demonstrated professional development over a period of years,
- exceptional laboratory or methodological skills documented by publication of work,
- the applicant's written "statement of goals,"
- evaluation of the quality of the undergraduate institution(s) attended and associated program of study,
- evidence of creative ability, and
- personal interviews with the applicant.

NOT ADVANCED DEGREE CANDIDATE (NADC)

The classification is for students who:

1. prefer to not pursue a graduate degree in the near future, or
2. have a GPA less than 3.0 and want to apply for regular admission after taking 12 semester credits of graded graduate-level courses as a NADC student.

Students must pay graduate fees and must be admitted to the Program specifically as a NADC student. The students must maintain a 3.0 GPA once admitted.

After completing 12 credits of graded graduate-level work, NADC students may apply to the Program for regular admission; however, there is no guarantee that they will be accepted. If accepted, the following number of course credits taken as a NADC student (i.e., in which a "B" or higher grade was received) may be applied to the student's graduate program:

- 9 credits maximum for students selecting the Non-Thesis option, or
- 6 credits maximum for students selecting the Thesis option.

The time limit for using any graduate credit taken as a NADC student towards a master's degree is 6 yr.

UNDECIDED GRADUATE (UND-G)

This classification is for potential graduate students who have not fulfilled the application requirements and prefer to start taking courses immediately. The students will be:

1. required to pay graduate fees,
2. permitted to enroll in courses only with permission of the instructor and the program and/or department offering the courses,
3. permitted to apply up to six (6) credits of graduate-level courses taken in the UND-G classification to the:
 - graduate degree requirements, and
 - accumulative GPA,provided:
 - grades of "B" or higher were earned, and
 - acceptance to the Program and Graduate School is gained within the calendar year in which the credits were earned.

If an UND-G student decides to apply to the Graduate School, there is no guarantee that the applicant will be accepted. The time limit for using any graduate credit taken as an UND-G student towards a master's degree is six (6) years.

POSTBACCALAUREATE (CLASS 5B STUDENTS)

A maximum of six (6) semester credits appropriate to a thesis master's program, 9 semester credits appropriate to a non-thesis master's program, which were earned at WSU and not utilized for fulfillment of an undergraduate or professional degree requirements, may be applied toward a graduate degree program. The credits must be reserved for graduate credit prior to enrollment in the courses. No credit earned with a grade lower than "B" may be applied towards a graduate degree.

GRADUATE LEAVE STATUS

Graduate students are considered to be actively pursuing a degree from the time of first enrollment in Graduate School until graduation or until the time limit has expired. Students who, for any reason, find that they cannot continually enroll for credit for a Fall or Spring semester are considered to be on Graduate Leave Status.

- Students on Graduate Leave Status may discontinue enrollment for credit for a period of 12 months without penalty. After that time, students on Graduate leave Status who wish to re-enroll will be assessed a fee that must be paid before they are allowed to re-enroll for credit.
- Students on Graduate Leave Status will be considered by the Graduate School to be in good standing for up to four (4) consecutive years. After four years, students must pay an application fee and reapply for admission to the Graduate School and to the Environmental Science Program.
- Students who have been on Graduate Leave Status for more than two (2) consecutive semesters (not including Summer semester) must receive approval of the Program Coordinator to re-enroll. The signature of the Program Coordinator on the re-enrollment application form will indicate such approval.

ADVISOR AND GRADUATE COMMITTEE

Following admission to the Graduate School, the student will be assigned an Advisor by the Program Coordinator. The student, in consultation with the Advisor, will nominate at least two other individuals to serve on the student's Graduate Committee. The Graduate Committee must consist of a minimum of three members, including the Advisor who serves as the Chair. All three members must hold at least a master's degree and an appointment to WSU. The Graduate Committee must be approved by the Program Coordinator, Associate Director of the School of Earth and Environmental Science (SEES), and the Graduate School which is accomplished in connection with securing approval of the student's program of study.

PROGRAM OF STUDY

The student, in consultation with the Committee Chair, will develop a program of study that defines which courses the student has taken and must still complete prior to graduation. The program of study is subject to discussion and negotiation with all of the student's Graduate Committee members. The completed Program for Master's Degree form must be approved and signed by the Committee members and provided to the Program Coordinator for approval. The form is then submitted to the Associate Director of SEES and forwarded to the Graduate School for approval. The form must be submitted to the Graduate School no later than the beginning of the semester proceeding the semester of graduation.

MASTER'S DEGREE REQUIREMENTS

Students have the option of a Thesis or Non-Thesis degree program. The course requirements of the two options are listed below. A student may petition the Graduate Studies Committee for an exception to these requirements if the petition is based on academic goals of the proposed program of study.

THESIS OPTION

The Thesis degree program requires:

- a minimum of 32 semester credits, including
 - at 6 least credits of Master's Thesis (ES/RP 700),
 - a minimum of 26 credits of graduate course work including
 - not more than 6 credits of 300- and/or 400-level courses,
 - not less that 21 credits of graded course work, and
- completion of a Thesis that is approved by the Graduate Committee, Program Coordinator, and Graduate School.

NON-THESIS OPTION

The Non-Thesis degree program requires:

- minimum of 32 semester credits, including
 - at least 4 credits of Master's Special Problems (ES/RP 702),
 - a minimum of 28 credits of graduate course work including
 - not more than 9 credits of 300- and/or 400-level courses,
 - not less that 26 credits of graded course work, and
- completion of a Project Research Report that is approved by the Graduate Committee and Program Coordinator.

GRADUATE CREDIT-APPROVED COURSES

All 600- and 700-level courses are offered as non-graded credit only. Credits earned by correspondence may be applied to remove undergraduate deficiencies; however, they may not be used to meet course requirements for the student's graduate program. Graduate credit is not given for workshops presented on or off campus.

RESEARCH PROJECT

The Thesis or Master's Project Report is the ultimate requirement of the student's degree program. Either shall consist of a substantial research project in which the student must demonstrate the ability to conduct research that is

- rigorous,
- independent, and
- original.

The student must become a "master" of the topic and be able to defend the Thesis or Master's Project Report to technical peers. The Master's Project Report should exhibit the same qualities as a Thesis but with a narrower scope and less formal presentation.

The topic of the Thesis or Master's Project Report is developed by the student, normally in consultation with the Committee Chair. The student should develop a draft research proposal, modify it in consultation with the Chair, and obtain concurrence of the remaining Committee members. The Master's research topic will be listed on the Program for Master's Degree form, which is provided to the Program Coordinator for approval prior to submittal to the Associate Director of SEES.

OPEN-LITERATURE PUBLICATION

Students are strongly encouraged to develop an open-literature publication in place of the traditional Thesis or Master's Project Report. The student's Graduate Committee members have the option of approving a manuscript that, in their opinions, is sufficient for publication in the open literature. The manuscript should be expanded to include title and signature pages, abstract, and, as needed, appendices that contain such items as an expanded literature review, material and methods section, and appropriate raw and/or summarized data.

FINAL ORAL EXAMINATION

All students are required to take a final oral examination following the completion of their Thesis or Master's Project Report. They must also have completed, or currently be enrolled in, all required course work and have registered for a minimum of two (2) credits of ES/RP 700 or 702 credits at the beginning of the semester in which the examination is to be taken. The purpose of the examination is to test the candidate's ability to integrate and interpret material in environmental science and supporting fields with emphasis on the results presented in the Thesis or Master's Project Report.

SCHEDULING

The examination should be scheduled only after the student's Graduate Committee members are in general agreement that the student's Thesis or Master's Project Report is close to being acceptable and that the student is ready to take the examination. The examination must be officially scheduled by the Committee Chair, in coordination with the student, other Graduate Committee members, and Program Coordinator. The examination must be:

1. held before the last week of the semester the student plans to graduate,
2. scheduled to be held no sooner than 10 working days after submission of the required scheduling forms, and
3. scheduled before the deadline announced by the Graduate School for the semester the student plans to graduate.

THESIS OPTION

Thesis-option students:

1. must initiate completion and procure the signatures of all committee members on the *Dissertation/Thesis Acceptance/Final Examination Scheduling* form so that the Graduate School receives the form at least 10 days prior to the examination date,
2. must provide a typed "final draft" version of the Thesis to the Graduate School for approval of the format at least 10 days prior to the examination date, and
3. must provide copies of the typed "final draft" version of the Thesis to the Graduate Committee members, Program Coordinator, and Associate Director of SEES at least five (5) days prior to the scheduled examination.

NON-THESIS OPTION

Student in the Non-Thesis option:

1. must initiate completion and procure the signatures of all Committee members on the *Non-Thesis Final Examination Scheduling* form so that the Graduate School receives the form at least 10 days prior to the examination date, and

2. must provide copies of the typed "final draft" version of the Master's Project Report to the Graduate Committee members, Program Coordinator, and Associate Director of SEES at least five (5) days prior to the scheduled examination.

LOCATION

The examination is to be held in an academic environment, during normal working hours, on the Tri-Cities or other WSU campus. The examination may also be held over the Academic Media Services' videoconferencing system.

ORAL PRESENTATION

The actual examination is normally preceded by an oral presentation by the student. The subject of the presentation, which should not exceed 30 minutes in length, is on the student's research topic. The presentation provides the student with an opportunity to summarize the results and conclusions of the research project and, in part, sets the stage for the oral examination.

ORAL EXAMINATION

The oral examination usually immediately follows the oral presentation. It is normally one hour in duration and is limited to one and one-half hours. The Committee Chair, who represents the Graduate Studies Committee, shall chair the examination. The examining committee shall include the members of the Graduate Committee and any other faculty member in attendance. Although the examination is open to the public, only members of the Graduate Committee, other faculty members, and, as permitted by the Representative of the Graduate Studies Committee, non-faculty attendees may ask questions. Only members of the Graduate Committee and faculty members may vote. All members of the Graduate Committee must attend the examination and vote.

FAILED EXAMINATION

In the event of a failed examination, a second and final attempt may be scheduled at the request of the Associate Director of SEES after a lapse of at least three months.

FINALIZING THE THESIS OR MASTER'S PROJECT REPORT

Following the successful completion of the oral examination, students will have five (5) working days to finalize their Thesis or Master's Project Report and submit it to the Graduate School.

ACADEMIC STANDARDS

CUMULATIVE GPA

To graduate, a student must have a cumulative grade point average (GPA) of at least 3.0 for all courses taken after admission to the Program (i.e., except for the first grade for repeated courses). Courses may not be repeated for a higher grade if the final grade is "C" or higher.

PROGRAM OF STUDY COURSES

The GPA for the courses listed on the student's program of study must be at least 3.0. No work of "B-" or below may be dropped; however, courses in which a grade of "C-" or below are earned must be repeated, but not on a pass/fail basis. All grades earned as a graduate student in courses listed in the program of study, except the first grade for a repeated course, must be averaged into the student's GPA.

CONTINUED ENROLLMENT

Students must meet the following criteria to maintain enrollment in the Program:

- Regular Status - Must have a GPA of at least
 - 2.75 after completing one semester, and
 - 3.0 after completing two semesters.
- Provisional Status - Must maintain a GPA of at least 3.0.

REINSTATEMENT

Depending on the GPA and number of semesters enrolled as a graduate student, the student may be reinstated upon favorable recommendations of the Program Coordinator and Associate Director of SEES with approval by the Graduate School.

TIME LIMIT

The time limit for use of graduate credit towards a master's degree is six (6) years from the beginning date of the earliest course applied toward the degree. As necessary, the Program Coordinator may request an extension for up to one year.

CURRICULUM

The course requirements of the various specialization areas in the Environmental Science Program are presented below. The courses selected to complete the requirements for the master's degree will actually be selected by the student in consultation with the student's Committee Chair with approval by the student's Graduate Committee, Program Coordinator, Associate Director of SEES, and Graduate School.

SEMINAR IN ENVIRONMENTAL SCIENCE

All matriculated Environmental Science graduate students are expected to enroll in the Seminar in Environmental Science (ES/RP 593) for at least four (4) semesters; however, students are expected to attend all seminars unless they conflict with other courses or the students' work schedules. A maximum of one (1) credit may be used towards graduation. The seminars are presented to help the students and faculty remain current in the various interdisciplinary research and scholarly topics in environmental science. The seminars are also intended to help the students learn how to prepare and deliver quality oral presentations since each student must give a presentation in the seminar series prior to graduation. The topic of the presentation, selected in consultation with the current instructor of ES/RP 593, should be one in which the student has special knowledge or a topic chosen for library research. The theme of the seminar may also be a problem statement or the results of a literature review conducted in anticipation of the student's master's research topic (e.g., proposed research objectives and method of approach). A student should be registered for ES/RP 593 for the semester in which the student gives a seminar. Seminars will also be presented by faculty members in the Environmental Science Program, other WSU departments and programs, and guest lecturers from other universities and organizations.

GENERAL CURRICULUM REQUIREMENTS

<u>Course #</u>	<u>Sem Credits</u>	<u>Title/Subject</u>
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Program-Wide Course Requirements:

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|------------------|---|---|
| 1. Several | 3 | Applied biological, physical, or social science course ^[4] |
| 2. Several | 3 | Quantitative skills course (e.g., statistics) |
| 3. Several | 3 | Ecology course |
| 4. ES/RP 544 | 4 | Environmental Assessment |
| 5. ES/RP 590/1/2 | 2 | Special Topics in Environmental Science |
| 6. ES/RP 593 | 1 | Seminar in Environmental Science |
| 7. ES/RP 700 | 6 | Thesis <u>OR</u> |
| ES/RP 702 | 4 | Special Problems |

Recommended Program-Wide Courses:

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|--------------|---|---|
| 1. Biol 480 | 2 | Writing in Biology |
| 2. Biol 530 | 4 | Statistical Ecology |
| 3. ES/RP 420 | 2 | Field and Lab Techniques in Environmental Science |
| 4. ES/RP 535 | 4 | Resolving Environmental Conflicts |
| 5. ES/RP 524 | 2 | Environmental Health Assessment |
| 6. ES/RP 594 | 3 | Environmental and Natural Resources Issues & Ethics |
| 7. ES/RP 597 | 2 | Technical and Public Communications in Env. Sci. |
| 8. Stat 412 | 3 | Biometry |
| 9. Stat 422 | 2 | Sampling Methods |

Recommended Specialization Area-Specific Courses:

I. Applied Environmental Science - Students will develop a program in consultation with their Graduate Advisor and Committee members.

II. Earth Science –

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|---------------|---|---|
| 1. CE 475 | 3 | Ground Water Hydrology |
| 2. ES/RP 403 | 3 | Environmental Geology |
| 3. ES/RP 420 | 2 | Field and Lab Techniques in Environmental Science |
| 4. ES/RP 517 | 3 | Fate and Effects of Environmental Contaminants |
| 5. ES/RP 581 | 2 | Environmental Chemistry I |
| 6. ES/RP 545 | 3 | Hazardous Waste Management |
| 7. ES/RP 550 | 3 | System Dynamics Models of Environmental Systems |
| 8. ES/RP 552 | 3 | Environmental Microbiology |
| 9. ES/RP 560 | 3 | Watershed Management |
| 10. ES/RP 586 | 4 | Introduction to GIS |
| 11. ES/RP 5XX | 3 | Fundamentals of Environmental Hydrology <i>[new course]</i> |
| 12. ES/RP 5XX | 3 | Fundamentals of Geochemistry <i>[new course]</i> |
| 13. Stat 428 | 3 | Geostatistics |

^[4] Course(s) should be outside the student's specialization area.

Course #	Sem Credits	Title/Subject
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III. Environmental and Occupational Health Science -

1. Chem 521	2	Radiochemistry and Radiotracers
2. Chem 522	1	Radiochemistry Laboratory
3. ES/RP 406	2	Introduction to Radiological Sciences
4. ES/RP 502	3	Human Health and the Environment
5. ES/RP 509	3	Applied Radiological Physics
6. ES/RP 510	3	Applied Radiation Dosimetry
7. ES/RP 516	4	Radiation Biology
8. ES/RP 507	2	Fundamentals of Industrial Hygiene
9. ES/RP 524	2	Environmental Health Assessment
10. ES/RP 530	2	Fundamentals of Industrial Safety
11. ES/RP 531	3	Fundamentals of Environmental Toxicology
12. ES/RP 532	3	Applied Environmental Toxicology
13. ES/RP 5XX	3	Occupational Health Physics <i>[new course]</i>
14. Stat 412	3	Biometry

IV. Environmental Regulatory Compliance –

1. ES/RP 335	3	Environmental Policy
2. ES/RP 420	2	Field and Lab Techniques in Environmental Science
3. ES/RP 481	3	Economics of Environmental Issues
4. ES/RP 502	3	Human Health and the Environment
5. ES/RP 504	3	Ecosystem Management
6. ES/RP 534	3	Industrial Ecology: Theory and Practice
7. ES/RP 535	3	Resolving Environmental Conflicts
8. ES/RP 545	3	Hazardous Waste Management
9. ES/RP 548	3	Environmental Law
10. ES/RP 551	3	Energy Production and the Environment
11. ES/RP 555	3	Environmental Planning
12. ES/RP 524	2	Environmental Health Assessments
13. Stat 412	3	Biometry
14. Stat 422	2	Sampling Methods

V. Environmental Toxicology -

1. ES/RP 406	2	Introduction to Radiological Sciences
2. ES/RP 502	3	Human Health and the Environment
3. ES/RP 507	2	Fundamentals of Industrial Hygiene
4. ES/RP 516	4	Radiation Biology
5. ES/RP 531	3	Fundamentals of Environmental Toxicology
6. ES/RP 532	3	Applied Environmental Toxicology
7. ES/RP 551	2	Energy Production and the Environment
8. ES/RP 524	2	Environmental Health Assessment
9. Stat 412	3	Biometry
10. Stat 422	2	Sampling Methods

Course #	Sem Credits	Title/Subject
<u>VI. Water Resource Science –</u>		
1. Biol 390	1	Stream Monitoring
2. Biol 410	3	Marine Ecology
3. Biol 413	3	Fish Ecology
4. Biol 465	2	Field Stream Ecology
5. Biol 530	4	Statistical Ecology
6. ES/RP 411	3	Limnology and Aquatic Ecosystem Management
7. ES/RP 504	3	Ecosystem Management
8. ES/RP 524	2	Environmental Health Assessment
9. ES/RP 531	3	Fundamentals of Environmental Toxicology
10. ES/RP 532	3	Applied Environmental Toxicology
11. ES/RP 550	3	System Dynamics Models of Environmental Systems
12. ES/RP 560	3	Watershed Management
13. ES/RP 584	4	Engineering Aspects of Aquatic Biology
14. ES/RP 585	3	Aquatic System Restoration
15. ES/RP 586	4	Introduction to GIS
16. ES/RP 5XX	3	Fundamentals of Environmental Hydrology <i>[new course]</i>
17. ES/RP 5XX	3	Fundamentals of Geochemistry <i>[new course]</i>
18. Stat 412	3	Biometry
19. Stat 422	2	Sampling Methods