

CONSERVATION AND ENVIRONMENTAL SCIENCES, BA

At UWM, students with a passion for nature and the environment can obtain a solid education in the natural sciences that are central to environmental science - biology, geosciences, and chemistry - and the social sciences of geography, economics, and politics which guide the application of conservation and environmental science in the real world.

Students at UWM can focus their conservation and environmental science work around land resources, water resources, biological resources/biodiversity, or environmental analysis. Internships and field work complement classroom learning. These opportunities can be found locally at UWM's own Field Station (<http://uwm.edu/letters-science/programs/?discipline=Field+Station>), on Lake Michigan aboard UWM's R/V Neeskey vessel, and at local agencies, or abroad in places as far flung as Iceland, Africa, Romania and the Caribbean.

An active Conservation Club is another student advantage at UWM. Activities range from on-campus sustainability projects to professional networking and more.

UWM's CES major builds on students' passion to solve environmental issues through either a BS or a BA degree. The BS requires more courses in math, biology, chemistry, and science and is suitable for careers in field or laboratory work, while the BA has fewer electives in science for a career in public programming, education, or administration.

Because of the breadth and flexibility of this major, students should consult with the Director and/or Coordinator to plan a course of study, preferably before the start of their sophomore year. It is particularly important to begin the introductory course sequences early, since they are prerequisites for advanced courses.

It is recommended that students obtain at least one semester of practical work or internship experience, either as an employee or as a volunteer, with state or federal resource management agencies, consulting firms, conservation or environmental organizations, or with nature centers or local parks.

Requirements Course of Study – Bachelor of Arts Degree

Complete 120 credits including 90 credits in the College of Letters & Science and with 36 of the 90 credits in L&S upper-level (numbered above 300) courses. The College requires that students must complete in residence at UWM at least 15 credits in upper-division (numbered 300 or above) courses in their major. Students are also required to complete University-wide General Education Requirements and the specific L&S requirements listed below.

To complete a major, students must satisfy all the requirements of the major as stated in this catalog. Students who declare their majors within five years of entering the UW System as a degree candidate may satisfy the requirements outlined in any catalog issued since the time they entered. Credits used to satisfy the major also may be used to satisfy other degree requirements.

University General Education Requirements (GER)

Code	Title	Credits
Oral and Written Communication		
<i>Part A</i>		
ENGLISH 102	College Writing and Research (or equivalent)	
<i>Part B</i>		
Course designated as OWC-B; may be completed through a major-specific course requirement		
Quantitative Literacy		
<i>Part A</i>		
Select one of the following:		
MATH 103	Contemporary Applications of Mathematics	
MATH 105	Introduction to College Algebra	
MATH 108	Algebraic Literacy II	
MATH 111	Introduction to Logic - Critical Reasoning ¹	
or PHILOS 111	Introduction to Logic - Critical Reasoning	
Or equivalent course		
<i>Part B</i>		
Course designated as QL-B; may be completed through a major-specific course requirement		
Arts		
Select 3 credits		3
Humanities		
Select 6 credits		6
Social Sciences		
Select 6 credits		6
Natural Sciences		
Select 6 credits (at least two courses including one lab)		6
UWM Foreign Language Requirement		
Complete Foreign Language Requirement through:		
Two years (high school) of a single foreign language		
Two semesters (college) of a single foreign language		
Or equivalent		
UWM Cultural Diversity Requirement		
One course from the Arts, Humanities, or Social Sciences must also satisfy UWM's Cultural Diversity requirement		

¹ Math 111 and Philosophy 111 are jointly offered and count as repeats of one another. Students cannot receive credit for both courses.

College of Letters & Science Requirements

I. English Writing Requirement

Students must satisfy the English Writing Requirement by completing ENGLISH 102 with a grade of C or higher or by placing beyond ENGLISH 102 on the English Placement Test (EPT).

Note: This requirement is the same as the University General Education Requirement for Oral and Written Communication Part A. The College of Letters & Science does not have a specific requirement for a writing course beyond English 102, but students must complete the university-wide requirement for Oral and Written Communication Part B listed above.

II. Mathematics and Formal Reasoning

To satisfy the Mathematics and Formal Reasoning Requirement, students must satisfy the following two requirements:

1. Achieve a Math Placement score of at least 30 or earn at least 3 credits with a grade of C or higher in one of the following courses or an equivalent course:

Code	Title	Credits
MATH 102	Mathematical Literacy for College Students II	3
MATH 103	Contemporary Applications of Mathematics	3
MATH 105	Introduction to College Algebra	3
MATH 108	Algebraic Literacy II	3
MATH 111	Introduction to Logic - Critical Reasoning ¹	3
or PHILOS 111	Introduction to Logic - Critical Reasoning	
MATH 175	Mathematical Explorations for Elementary Teachers I	3

¹ Math 111 and Philosophy 111 are jointly offered and count as repeats of one another. Students cannot receive credit for both courses.

Note: This requirement is the same as the University General Education Requirement for Quantitative Literacy Part A, listed above.

2. Complete one course (at least 3 credits) at the 200 level or above chosen from courses in Mathematics, PHILOS 211, or Letters and Science statistics courses:

Code	Title	Credits
Complete one of the following:		
3 or more credits in any 200-level or above Math course		
AFRIC 220	Introduction to Statistics in African and African Diaspora Studies	
ANTHRO 568	Introduction to Anthropological Statistics	
ATM SCI 500	Statistical Methods in Atmospheric Sciences	
BIO SCI 465	Biostatistics	
ECON 210	Economic Statistics	
GEOG 247	Quantitative Analysis in Geography	
HIST 595	The Quantitative Analysis of Historical Data	
MTHSTAT 215	Elementary Statistical Analysis	
PHILOS 211	Elementary Logic	
POL SCI 390	Political Data Analysis	
POL SCI 392	Survey Research	
PSYCH 210	Psychological Statistics	
SOCIOL 261	Introduction to Statistical Thinking in Sociology	

Note: This requirement is NOT the same as the University General Education Requirement for Quantitative Literacy Part B. To complete the BA, students must take one of the L&S approved courses. The courses listed here will satisfy the QL-B requirement.

III. Foreign Language Requirement

Placement testing may be used to satisfy all or part of this requirement. Language courses (including American Sign Language) other than English taken in high school may be used to satisfy all or part of this requirement. One year of high school language equates to one semester of college work.

Completion of the L&S Language Requirement also satisfies the university-wide Foreign Language GER, but not vice versa.

Code	Title	Credits
Completed in one of the following ways:		0-18
Successful completion of the 4th semester of college work or equivalent in one language other than English (including American Sign Language)		
Successful completion of the 3rd semester of college work or equivalent in one language other than English (including American Sign Language) PLUS the 2nd semester of college work or equivalent in another language other than English (including American Sign Language)		

IV. International Requirement

See Approved Courses for the L&S International Requirement (<http://catalog.uwm.edu/letters-science/approved-courses-international-requirement>) for course options.

Code	Title	Credits
Completed in one of the following ways:		9
Complete 3 courses (min. 9 cr) in a single foreign language (not including literature-in-translation or American Sign Language) at the 3rd semester level and above		
Complete 3 non-language courses (min. 9 credits) with an international content chosen from at least 2 curricular areas.		
Complete 9 credits in combination of the two options above.		

V. Breadth Requirement

Along with completing the University General Education Requirements of 3 credits in the Arts (A); 6 credits in the Humanities (HU), Social Sciences (SS), and Natural Sciences (NS/NS+); and a course with the Cultural Diversity (CD/+) designation, L&S students must complete the Breadth requirement.

Code	Title	Credits
Arts		
Select 3 credits		3
Humanities		
Complete 12 credits of L&S courses with Humanities Breadth designation; no more than 6 credits from a single subject area. *		12
Social Sciences		
Complete 12 credits of L&S Courses with Social Science Breadth designation; no more than 6 credits from a single curricular area. *		12
Natural Sciences		
Complete 12 credits of L&S Courses with Natural Sciences Breadth designation, including at least one laboratory or field course; no more than 6 credits from a single curricular area. *		12
Cultural Diversity		
Complete 3 credits in a course with Cultural Diversity (CD) designation. **		3

* Students should check their course selections carefully with the list of approved L&S Breadth Courses (<http://catalog.uwm.edu/letters-science/breadth-requirement-course-list>). Students are advised to select at least 6 credits worth of courses in each of the Humanities, Social Science, and Natural Sciences areas that can satisfy both the campus-wide General Education Requirements and the L&S Breadth requirement.

** Students are advised to select a course that satisfies the Cultural Diversity requirement as well as a Humanities or Social Science breadth/GER requirement.

VI. The Major

The College of Letters and Science requires that students attain at least a 2.0 GPA in all credits in the major attempted at UWM. In addition, students must attain a 2.0 GPA on all major credits attempted, including any transfer work. Individual departments or programs may require higher GPAs for graduation. Some departmental majors require courses from other departments. Contact your major department for information on whether those credits will count as part of the major GPA. The College requires that students must complete in residence at UWM at least 15 credits in upper-division (numbered 300 or above) courses in their major.

Research Requirement

Within their majors, students must complete a research experience approved by the L&S faculty. A list of courses satisfying the research requirement in each major can be found here (<http://catalog.uwm.edu/letters-science/approved-courses-research-requirement>).

VII. The Minor

The College of Letters and Science requires that students attain at least a 2.0 GPA in all credits in the minor attempted at UWM. In addition, students must attain a 2.0 GPA on all minor credits attempted, including any transfer work.

Conservation and Environmental Science Major Requirements

For those students interested in the Water Track, please see the Bachelor of Science in Conservation and Environmental Science (<http://catalog.uwm.edu/letters-science/conservation-environmental-science/conservation-environmental-science-bs>) major.

Coursework for the Major (Conservation and Natural Resources Track)

The **Conservation and Natural Resources Track** requires a minimum of 54 credits, 29 of which are advanced-level. All students in the Conservation and Natural Resources track must fulfill the required 36 credits (25 lower-level core credits, and 11 advanced-level credits) and an additional 18 advanced-level credits from among the approved Conservation and Natural Resources Track electives.

Students must complete the courses listed below, including at least 15 upper-division (numbered 300 and above) credits in the major in residence at UWM. The College of Letters & Science requires that students attain at least a 2.0 GPA on all credits in the major attempted at UWM. In addition, students must attain a 2.0 GPA on all major credits attempted, including any transfer work.

Code	Title	Credits
Required Introductory Core		
BIO SCI 150	Foundations of Biological Sciences I	4
BIO SCI 152	Foundations of Biological Sciences II	4

CES 210	Introduction to Conservation and Environmental Science	3
CHEM 102	General Chemistry	5
GEO SCI 100 or GEO SCI 120	Introduction to the Earth Geology of the Planets	3
GEO SCI 102 or GEO SCI 150	Principles of Historical Geology Introduction to Ocean Sciences	3
GEOG 215	Introduction to Geographic Information Science	3

Mid-Level Distributional Requirement

BIO SCI 310	General Ecology	4
GEOG 350	Conservation of Natural Resources	3

Upper-Level Core

Select 18 upper-level approved CES electives with at least 3 credits taken from each of the following areas

Biological Sciences
Geosciences
Geography

Research Requirement

CES 471	Practicum in Natural Resources Management	4
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Total Credits 54

List of Approved Electives in the Conservation and Natural Resources Track

Code	Title	Credits
ANTHRO 103	Digging Up the Past: Approaches to Archaeology	3
ANTHRO 355	Globalization, Culture, and Environment	3
ANTHRO 441	Nature, Knowledge, and Technoscience in Anthropological Perspective	3
ANTHRO 448	Cultural and Human Ecology	3
ATM SCI 100	Survey of Meteorology	3
ATM SCI 240	Introduction to Meteorology	3
ATM SCI 330	Air-Pollution Meteorology	3
BIO SCI 289	Internship in Biological Sciences, Lower Division	1-6
BIO SCI 315	Cell Biology	3
BIO SCI 325	Genetics	4
BIO SCI 358	Birds of Wisconsin	2
BIO SCI 370	Animal Physiology	3
BIO SCI 383	General Microbiology	4
BIO SCI 406	Marine Biology	3
BIO SCI 407	Plant Systematics and Evolution	3
BIO SCI 430	Animal Behavior-Ethology	3
BIO SCI 451	Field Methods in Conservation	3
BIO SCI 458	Community Ecology	3
BIO SCI 465	Biostatistics	3
BIO SCI 475	Tropical Biology	3
BIO SCI 480	Ecological Genetics	3
BIO SCI 489	Internship in Biological Sciences, Upper Division	1-6
BIO SCI 500	Plant Physiology	3
BIO SCI 505	Conservation Biology	3

BIO SCI 507	Environmental Microbiology	3
BIO SCI 511	Ichthyology	3
BIO SCI 512	Limnology I	3
BIO SCI 523	Evolution and Ecology of Birds	3
BIO SCI 540	Microbial Diversity and Physiology	3
BIO SCI 562	Topics in Field Biology:	1-2
BIO SCI 611	Seminar on Recent Advances in Limnology and Oceanography	2
CES 289	Internship in Environmental Studies, Lower Division	1-6
CES 451	Field Methods in Conservation	3
CES 461	The Politics and Policy of Sustainability	3
CES 489	Internship in Environmental Studies, Upper Division	1-6
CES 497	Study Abroad:	1-12
CES 499	Ad Hoc:	1-6
CES 550	Introduction to Science Interpretation	3
CES 551	Application of Science Interpretation	3
CES 571	Practical Approaches to a Sustainable Future	3
CHEM 221	Elementary Quantitative Analysis	4
CHEM 341	Introductory Survey of Organic Chemistry	3
CHEM 342	Introductory Organic Chemistry Laboratory	2
CHEM 343	Organic Chemistry	3
CHEM 344	Organic Chemistry Laboratory	2
CHEM 345	Organic Chemistry	3
CHEM 501	Introduction to Biochemistry	3
CHEM 524	Instrumental Analysis	3
CHEM 560	Biophysical Chemistry	3
CHEM 603	Introduction to Biochemistry Laboratory	2
ECON 328	Environmental Economics	3
ECON 525	The Economics of Water	3
GEOG 215	Introduction to Geographic Information Science	3
GEOG 247	Quantitative Analysis in Geography	3
GEOG 304	Human Impact on the Environment	3
GEOG 306	Natural Hazards	3
GEOG 310	General Climatology	3
GEOG 340	Biogeography	3
GEOG 350	Conservation of Natural Resources	3
GEOG 403	Remote Sensing: Environmental and Land Use Analysis	4
GEOG 405	Cartography	4
GEOG 411	Physical Climatology	3
GEOG 415	Hydrogeography	3
GEOG 420	Methods and Principles in Land Form Geography	3
GEOG 424	Karst Geomorphology	3
GEOG 450	Climates of the Past and Climate Change	3
GEOG 455	Applied Climatology	3
GEOG 464	Environmental Problems	3
GEOG 475	Geography of Soils	3
GEOG 515	Watershed Analysis and Modeling	3
GEOG 520	Physical Geography of the City	3
GEOG 525	Geographic Information Science	4
GEOG 547	Spatial Analysis	4
GEOG 564	Urban Environmental Change and Social Justice	3
GEOG 625	Intermediate Geographic Information Science	4
GEO SCI 301	Principles of Mineralogy	3
GEO SCI 400	Water Quality	3
GEO SCI 409	Process Geomorphology	3
GEO SCI 443	Glacial and Pleistocene Geology	3
GEO SCI 463	Physical Hydrogeology	3
GEO SCI 464	Chemical Hydrogeology	3
GEO SCI 562	Environmental Surface Hydrology	3
GEO SCI 563	Field Methods in Hydrogeology	3
GEO SCI 697	Seminar in the Geological Sciences:	1-3
HIST 432	North American Environmental History	3
JAMS 503	Environment and the Media	3
MTHSTAT 215	Elementary Statistical Analysis	3
SOCIOL 450	Environmental Sociology	3

Approved CES Course Electives Outside of the College of Letters and Science

Although the following courses may count as credits toward the CES major requirements, they do not count to satisfy the advanced L&S credits requirement for the degree. Consult the program coordinator before enrolling any of these courses.

Code	Title	Credits
ARCH 340	Urban Design	3
CIV ENG 492	Environmental Impact Assessment	3
FRSHWTR 502	Aquatic Ecosystem Dynamics	3
FRSHWTR 504	Quantitative Freshwater Analysis	3
PH 375	Topics in Public Health for Undergrads:	3
URBPLAN 591	Introduction to Urban Geographic Information Systems (GIS) in Planning	3

Other Potential Courses

Because of the interdisciplinary nature of the Conservation and Environmental Science Program, students are encouraged to work with the program coordinator to identify classes that will enable them best to gain the knowledge to achieve their goals. CES students can petition the Program to accept many classes beyond those listed above, if they are appropriate for the major and the individual student's program of study. For example, the following courses may apply:

Code	Title	Credits
ARCH 390	Special Topics:	1-3
ANTHRO 699	Independent Work	1-3
BIO SCI 497	Study Abroad:	1-12
BIO SCI 599	Special Topics in Biological Sciences:	1-3
BIO SCI 699	Independent Study	1-3

FRSHWTR 690	Undergraduate Seminar in Freshwater Sciences:	1-3
GEOG 698	GIS/Cartography Internship	1-6
GEOG 699	Independent Work	1-3
GEO SCI 699	Advanced Independent Reading	1-3

Declaration of Major

Students wishing to declare the major can obtain the necessary information and materials from the Biological Sciences Office (Lapham Hall, Room 181) or the CES Program Coordinator's office (Lapham Hall, Room 393) or from their College of Letters and Science advisor.

In order to be accepted into the CES program, students should be in their sophomore year and have completed:

Code	Title	Credits
CES 210	Introduction to Conservation and Environmental Science	3
BIO SCI 150	Foundations of Biological Sciences I	4
GEO SCI 100 or GEOG 120	Introduction to the Earth Our Physical Environment	3

In addition to course work in the major, good communication skills are essential; students should take courses in public speaking and technical writing. Computer literacy and knowledge of statistics also are highly desirable. Additionally, introductory courses in economics, ethics, political science, and sociology are recommended. The coordinator or a Letters and Science advisor can provide a current list of recommended courses.

Letters & Science Advising

The College of Letters and Science provides general academic advising for all students with a major in the College, particularly as it relates to campus' general education requirements and the College's degree requirements. We also provide specialized advising for pre-professional students (pre-med, pre-dental, pre-pharmacy, etc.) regardless if their major is in Letters and Science or not. Prospective students, including high school students and students seeking to transfer to a program in Letters and Science may also receive advising from our admissions counselors.

Upon admission, students are assigned an advisor in the College advising office. Academic advising is available Monday through Friday from 8:30 a.m. to 4:30 p.m. by appointment. Appointments outside of these times may be available and phone appointments are available for online students. The advising office (<https://uwm.edu/letters-science/advising/contact-advising>) is located on the first floor of Holton Hall. Current students should call (414) 229-4654 to schedule an appointment or use the Student Success Collaborative website (<https://uwmilwaukee.campus.eab.com>) to make an appointment with your assigned advisor; online scheduling is only available if you already have a Letters & Science advisor assigned to you. Prospective students should call (414) 229-7711 or email let-sci@uwm.edu.

When students declare a major, they will receive an additional faculty advisor located within the major department who will assist with requirements for that major. Students should read the "Declaration of Major" information on the website of the major that they are interested in. In some cases, the student will need to choose a faculty advisor as part of the declaration process.

All students are cautioned to consult their Letters & Science academic advisor AND their major advisor prior to each registration period to ensure they understand all requirements. Do not rely on pre-printed sample plans, as they are intended to be samples only and may not be right for your particular situation.

Honors in the College of Letters and Science

Dean's Honor List

GPA of 3.750 or above, earned on a full-time student's GPA on 12 or more graded credits in a given semester.

Honors Degree and Honors Degree with Thesis

Granted to graduating seniors who complete Honors College requirements, as listed in the Honors College (<http://catalog.uwm.edu/opportunities-resources/honors-college>) section of this site.

Commencement Honors

Students with a cumulative GPA of 3.500 or above, based on a minimum of 40 graded UWM credits earned prior to the final semester, will receive all-university commencement honors and be awarded the traditional gold cord at the December or May Honors Convocation. In schools and colleges in which fewer than 15% of the traditional students have a 3.500 GPA, all-university honors will be awarded to approximately the top 15% of graduating students. A criterion GPA (not lower than 3.200) for this 15% will be calculated based on statistics from the previous comparable semester. Please note that for honors calculation, the GPA is **not** rounded and is truncated at the third decimal (e.g., 3.499).

Final Honors

Earned on a minimum of 60 graded UWM credits: Cum Laude - 3.500 or above; Magna Cum Laude - 3.650 or above; Summa Cum Laude - 3.800 or above.

Contact Information

Current Students contact Mai Phillips, phillipm@uwm.edu
Prospective Students contact a Letters & Science Admissions Counselor at
(414) 229-7711 or let-sci@uwm.edu

<https://uwm.edu/conservation-environmental-science/undergraduate/>