

FRESHWATER AND MARINE SCIENCES, CERTIFICATE

Freshwater and marine ecosystems are vital to human well-being. They support vast biodiversity and provide drinking water, protein, and livelihoods to people worldwide. Both freshwater and marine systems are also highly threatened. Creating a sustainable future will require people with a foundational understanding of these ecosystems.

While many Freshwater and Marine Sciences certificate courses have a strong biological focus, this certificate emphasizes the interdisciplinary nature of the aquatic sciences and incorporates courses that span the physical and biological sciences and their application to real-world problems.

The certificate provides an opportunity for students interested in areas such as environmental science, ecology and evolution, natural resources management, environmental chemistry, public policy, public health, and social justice to incorporate water-related themes into their degree program.

The Freshwater and Marine Sciences certificate is offered by the Department of Integrative Biology in the College of Letters and Sciences, and includes courses from a broad range of departments including Atmospheric and Oceanic Sciences, Botany, Geoscience, Soil and Environmental Sciences, and Civil and Environmental Engineering.

The certificate is part of the Freshwater Collaborative of Wisconsin (<https://freshwater.wisconsin.edu/>), a statewide initiative of the Universities of Wisconsin (<https://www.wisconsin.edu/>).

HOW TO GET IN

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Please contact the Freshwater and Marine Sciences undergraduate advisor to declare the certificate.

Prerequisites: None.

REQUIREMENTS

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The certificate requires a minimum of 15 credits. Students must complete distinct courses in each requirement; they may not reuse courses to meet multiple requirements.

Code	Title	Credits
Core courses: Complete at least 5 credits from this list of courses.		5
ZOOLOGY 304	Marine Biology	
ZOOLOGY/ ENVIR ST 315	Limnology-Conservation of Aquatic Resources	
ZOOLOGY 316	Laboratory for Limnology-Conservation of Aquatic Resources	

ATM OCN/ GEOSCI 105	Survey of Oceanography
CIV ENGR 311	Hydroscience
SOIL SCI/ ATM OCN 132	Earth's Water: Natural Science and Human Use

Freshwater: Complete one course 2-3

ZOOLOGY/ ENVIR ST 315	Limnology-Conservation of Aquatic Resources
ZOOLOGY 316	Laboratory for Limnology-Conservation of Aquatic Resources
ATM OCN/ SOIL SCI 132	Earth's Water: Natural Science and Human Use
BOTANY 330	Algae
CIV ENGR 311	Hydroscience
CIV ENGR 415	Hydrology
CIV ENGR 416	Water Resources Systems Analysis
CIV ENGR 516	Hydrologic Data Analysis
LAND ARC/ ENVIR ST 361	Wetlands Ecology

Marine: Complete one course 2-4

ZOOLOGY 304	Marine Biology
ZOOLOGY 320	Field Marine Biology
ATM OCN/ GEOSCI 105	Survey of Oceanography

Freshwater and Marine: Courses count towards either requirement area.

ZOOLOGY 303	Aquatic Invertebrate Biology
ZOOLOGY/ ENVIR ST 510	Ecology of Fishes
ZOOLOGY/ ENVIR ST 511	Ecology of Fishes Lab
CIV ENGR 514	Coastal Engineering
ATM OCN 310	Dynamics of the Atmosphere and Ocean I

Electives to reach 15 credits, any Freshwater or Marine course beyond the minimum requirements counts as electives. 3-6

Total Credits 15

RESIDENCE AND QUALITY OF WORK

- Minimum 2.000 GPA on all certificate courses
- At least 8 credits must be taken in residence at UW-Madison

CERTIFICATE COMPLETION REQUIREMENT

This undergraduate certificate must be completed concurrently with the student's undergraduate degree. Students cannot delay degree completion to complete the certificate.

LEARNING OUTCOMES

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1. Develop an integrated understanding of the functioning of freshwater and marine ecosystems, with a focus on the integration of physical, chemical, and biological dimensions.
2. Apply a foundational understanding of freshwater and marine ecosystems to addressing current environmental problems.
3. Develop a deeper understanding of interdisciplinary water resource management issues, and to understand their broader societal context.
4. Gain career-relevant, hands-on experiences through field trips, lab analysis, and data collection and analysis.

ADVISING AND CAREERS

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Talk with the certificate advisor (zoo@ibio.wisc.edu) about selecting courses from the certificate's options to fit your own interests and goals.

Freshwater and Marine Sciences certificate students gain experience that prepares them for graduate study and/or careers such as limnology, water resource management, and marine biology. Career paths include water resources policy and management with local, state, or federal agencies, conservation groups, teaching and academic research, and private industry.

SUCCESSWORKS

SuccessWorks (<https://successworks.wisc.edu/>) at the College of Letters & Science helps you turn the academic skills learned in your classes into a fulfilling life, guiding you every step of the way to securing jobs, internships, or admission to graduate school.

Through one-on-one career advising, events, and resources, you can explore career options, build valuable internship and research experience, and connect with supportive alumni and employers who open doors of opportunity.

- What you can do with your major (<https://successworks.wisc.edu/what-you-can-do-with-your-major/>) (Major Skills & Outcomes Sheets)
- Make a career advising appointment (<https://successworks.wisc.edu/make-an-appointment/>)
- Learn about internships and internship funding (<https://successworks.wisc.edu/finding-a-job-or-internship/>)
- Try "Jobs, Internships, & How to Get Them," (<https://successworks.wisc.edu/canvas/>) an interactive guide in Canvas for enrolled UW-Madison students