Graduate Student

Handbook
2016-17

Master of Science in
Freshwater Sciences and Technology

freshwater.uwm.edu
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Welcome!

The UWM School of Freshwater Sciences (SFS) is located in Milwaukee, Wisconsin at the edge of the largest freshwater system on the surface of the Earth -- the Great Lakes. Established in 2009, SFS expands a tradition of freshwater studies at UWM that began in 1966 with the Center for Great Lakes Studies and continued with the Great Lakes WATER Institute in 1973.

Prepare to be part of the next generation of scientists, researchers, and policymakers committed to exploring, protecting, and preserving one of our most vital natural resources. We’re equipping future scientists and professionals with the interdisciplinary skills and expertise needed to address the critical challenges facing our freshwater resources.

Master’s Program of Study

Degree Options
The School of Freshwater Sciences offers both MS and PhD programs that prepare students for careers in the water sciences through novel approaches to the sustainable and equitable use and management of freshwater systems worldwide.

At the Master's level, students choose of the following options to provide a strong foundation:

• **Thesis:** an interdisciplinary research-based program to prepare students for careers in research and industry, or a doctoral degree.

• **Professional Science:** an interdisciplinary program combining science, management, and communication skills to prepare students for careers in water-related business, government and non-profit organization.
SFS Faculty and Scientists

Graduate Faculty

Professors
Carvan, Michael, PhD, Texas A&M University
Garman, David, PhD, University of Sydney
Grundl, Timothy, PhD, Colorado School of Mines
Guo, Laodong, PhD, Texas A&M University
Janssen, John, PhD, Michigan State University
Klaper, Rebecca, PhD, University of Georgia
Klump, J. Val, PhD, University of North Carolina
MclLellan, Sandra, PhD, University of Cincinnati

Associate Professors
Bootsma, Harvey, PhD, University of Manitoba
Kaster, Jerry, PhD, University of Colorado
Kehl, Jenny, PhD, University of Colorado-Boulder

Assistant Professors
Newton, Ryan, PhD, University of Wisconsin-Madison
Sepulveda Villet, Osvaldo Jhonatan, PhD, University of Toledo
Smith, Matthew, PhD, University of Tasmania
Waples, James, PhD, University of Wisconsin-Milwaukee

Scientists
Aguilar-Diaz, Carmen, PhD, University of Wisconsin-Milwaukee
Binkowski, Fred, MS, University of Wisconsin-Milwaukee
Cuhel, Russell, PhD, Massachusetts Institute of Technology & Woods Hole Oceanographic Institution
Deng, Dong-Fang, PhD, University of California-Davis

UWM Affiliate Faculty

Distinguished Professor
Roebber, Paul, PhD, McGill University
Strickler, Rudi, PhD, Swiss Federal Institute of Technology (Biological Sciences)

Professor
Berges, John, PhD, University of British Columbia (Biological Sciences)
Hutz, Reinhold, PhD, Michigan State University (Biological Sciences)

Associate Professors
Frank, Nancy, PhD, State University of New York-Albany (Criminal Justice)
Udvadia, Ava J., PhD, Duke University (Biological Sciences)
Young, Erica, PhD, Monash University (Biological Sciences)

Assistant Professors
Chang, Woo-Jin, PhD, Inha University (Mechanical Engineering)
Xu, Shangping, PhD, Princeton University (Geosciences)
SFS Academic Administration

Dr. Val Klump, Senior Director & Associate Dean of Research
vklump@uwm.edu, (414) 382-1715

Dr. Tim Grundl, Associate Dean of Academics
grundl@uwm.edu, (414) 382-1744

Dr. Harvey Bootsma, Graduate Program Representative
hbootsma@uwm.edu, (414) 382-1717

Margret Petrie, Assistant Dean of Academics & Student Services
petriem@uwm.edu, (414) 382-1704

Mallory Kaul, Academic Affairs Manager
malkaul@uwm.edu, (414) 382-1778

Lindsay Frost, Recruitment & Student Services Manager
lgfrost@uwm.edu, (414) 382-1783

Graduate School Student Services

Molly Wierzbicki, Assistant Director & SFS Program Service Representative
mkwierz@uwm.edu, (414) 229-4374

Jenna Jazna, Master's Graduation Specialist
jazna@uwm.edu, (414) 229-4234

Financial Support

Graduate School Fellowships
A limited number of competitively awarded fellowships are available to full time graduate students through the Graduate School. The Distinguished Graduate Student Fellowship, Graduate School Dissertation Fellowship, and Advanced Opportunity Fellowship include full remission of tuition, a monthly stipend and benefits such as health insurance.

Research Assistantships
Limited Research Assistantships are available for MS thesis track and PhD students, and provide support for specific research projects through external grants and projects awarded to individual faculty.

Scholarships
Explore current scholarship opportunities offered directly through the School of Freshwater Sciences.
The Master of Science Degree in Freshwater Sciences and Technology – Thesis Track

The Master of Science thesis track is an interdisciplinary research-based program for students interested in pursuing research positions or doctoral degrees. Thesis students conduct a directed research project leading to the writing and defense of a master’s thesis.

Credits and Courses

Minimum degree requirement is 30 graduate credits.

Required core courses (9 credits)
• FRSHWTR 502 Aquatic Ecosystem Dynamics (3 credits)
• FRSHWTR 504 Quantitative Freshwater Analysis (3 credits)
One of the following:
• FRSHWTR 506 Environmental Health of Freshwater Ecosystems (3 credits)
• FRSHWTR 508 Freshwater Engineering (3 credits)
• FRSHWTR 510 Economics, Policy, & Management of Water (3 credits)

Elective Courses (9-12 credits)
• To be selected in consultation with the student’s major professor.

Seminars and Practica (6 credits)
• Two FRSHWTR 901 Seminar in Freshwater Sciences (1-2 credits each)
• Two FRSHWTR 512 Freshwater Sciences Practicum (2 credits each)

Thesis research (up to 6 credits)

Grade Requirements
An average GPA of 3.0 (4.0 basis) or better is required in all work taken as a graduate student. Students receiving a grade of less than a “B” in coursework or an overall GPA < 3.0 will receive an academic warning from the Graduate Dean. Grades of “D” or “F” are unsatisfactory and do not count in meeting degree requirements. Poor performance will result in the student’s dismissal from the program.
Major Professor as Advisor

Prospective thesis-track students are strongly encouraged to reach out to faculty members whose interests align with their own to discuss potential major advisor, research and funding opportunities. Students in the thesis track must be accepted by a faculty member who will serve as the initial major professor, and be primarily responsible for matriculation.

Plan of Study
Submission of a plan of study identifying planned courses and a timeline for completion of the degree is required. For the thesis track, this includes coursework and proposed research and is planned by the student in consultation with the major professor and must be approved by the Thesis Advisory Committee.

Thesis Advisory Committee
The membership of the Thesis Advisory Committee should be established by the end of the student’s first semester. The Committee must consist of three members including the M.S. student’s advisor as chair (or co-advisors as co-chairs who are graduate faculty members from the School of Freshwater Sciences) and at least two additional members, one of whom must come from outside the student’s research focus. Consideration will be given to the inclusion of one external, non-UWM member of the committee. If included as part of the committee, this person would participate in the thesis defense examination. The Committee must meet at least once a year to monitor the student’s academic and research progress.

Thesis Requirements

Proposal Defense and Preliminary Oral Examination
The student must complete a formal oral defense of her or his written thesis proposal. This defense should be before the end of the third semester and will serve as the preliminary oral examination. The Thesis Committee decides by simple majority whether the student passes, fails, or must repeat the examination or defense. At the discretion of the Committee, a student who fails the defense or examination may be allowed one additional attempt at successful completion.

Thesis
The thesis is conducted with oversight from the student’s Advisory Committee. The thesis research is expected to be of a caliber sufficient for publication in a peer-reviewed journal. Satisfactory completion of the thesis, including successful defense, is required for graduation. Up to six credits may be awarded for thesis research. Please see the Graduate School thesis and dissertation formatting requirements for further information.

Thesis defense
The thesis defense is a public presentation of the thesis research followed by an oral defense administered by the Advisory Committee.
Time Limit

All degree requirements must be completed within five years of initial enrollment.

Applying for Graduation

*Master’s Graduation Procedures*
Graduation dates and deadlines must be followed in order to graduate. See the Graduate School steps to graduate for more information.

*Thesis Submission*
Follow the Graduate School thesis formatting procedures and make sure you submit by the deadline.

*Minimum Credit Registration*
You must be registered for at least 1 UWM graduate credit (audit not allowed) during the semester your degree is awarded. If you have met all academic requirements and do not need to take another course, or if you have reached your thesis credit limit, you may enroll in course 888, "Candidate for Degree." This course does not add to your credit total, apply to your degree, or affect your GPA. You are assessed the equivalent of one graduate credit in fees and receive a grade of S.

*Review and Approval*
The Graduate School does an initial review of your records to check the required minimum standards and forwards it to the SFS Graduate Program Representative to ensure that all requirements will be met by the last day of the term. SFS reviews and signs your application, and returns it to the Graduate School for processing. Contact Mallory Kaul if you have questions about the requirements. If you will not finish by the last day of the term, you must contact the Graduate School; the graduation application does not carry forward to the next term.

You cannot graduate with Incomplete, Not Reported, or In Progress notations remaining on your record. Graduate School minimum graduation GPA requirement is a cumulative 3.000 (4.0 basis). The Graduate School has final authorization to grant your degree.
Master of Science Degree in Freshwater Sciences and Technology – Professional Science Track

The Master of Science Professional Science track is an integrated science and business program that prepares students to apply skills in management, non-profit, and business settings. The program provides students with the opportunity to participate in a directed research experience through an internship or group project.

Credits and Courses

Minimum degree requirement is 36 graduate credits.

**Required core courses (12 credits)**
- FRSHWTR 502 Aquatic Ecosystem Dynamics (3 credits)
- FRSHWTR 504 Quantitative Freshwater Analysis (3 credits)

Two of the following:
- FRSHWTR 506 Environmental Health of Freshwater Ecosystems (3 credits)
- FRSHWTR 508 Freshwater Engineering (3 credits)
- FRSHWTR 510 Economics, Policy, & Management of Water (3 credits)

**Required professional core courses (9 credits)**
- FRSHWTR 810 Professional Development for Water Leaders (3 credits)
- BUSMGMT 706 Managing in a Dynamic Environment (3 credits)
- BUSMGMT 723 Managing and Negotiating Across Cultures (3 credits)
- BUSMGMT 715 Leadership, Team Building, and Effective Management (3 credits)
- PHILOS 337 Environmental Ethics (3 credits)

*Substitute courses* as approved by program director.

**Elective courses (12 credits)**
- To be selected in consultation with the student’s major professor.

**Research-focused internship (3 credits)**
- FRSHWTR 980 Graduate Internship (3 credits)

**Grade Requirements**
An average GPA of 3.0 (4.0 basis) or better is required in all work taken as a graduate student. Students receiving a grade of less than a “B” in coursework or an overall GPA < 3.0 will receive an academic warning from the Graduate Dean. Grades of “D” or “F” are unsatisfactory and do not count in meeting degree requirements. Poor performance will result in the student's dismissal from the program.
Major Professor as Advisor

Upon admission to the program, each student in the professional science track will be assigned an initial advisor who will provide counseling and help to identify goals and objectives of their graduate education. Students should identify their permanent advisor during the first semester in the program. The permanent advisor will oversee the student’s internship.

Plan of Study
A plan of study is required and planned by the student in consultation with his or her advisor and the internship coordinators of the program. The plan of study identifies the planned courses and timeline for completion of the degree coursework and internship.

Time Limits

The student must complete all degree requirements within seven years of initial enrollment.

Internship Requirement

All students in the professional science track are required to participate in an internship research experience (3 credits), generally between the first and second years of the program. Internship experiences will center on complex regional, national, and global water problems and support student learning relative to identified content, skill, and practice targets. Internship experiences will require learners to apply what they learn to authentic, practical problems in the field, both locally and, potentially, across the globe. The program coordinators will provide resources for students to secure research internship opportunities with regional, national, and international partners in industry, government, and non-profit sectors. It will be the responsibility of the student and advisor to identify the direct supervisor within a specific organization and submit a proposed plan of study that identifies goals and objectives for their internship experience. Proposals will be reviewed by your advisor and approved based on how the internship experience meets program goals, the feasibility of the proposed plan, and the qualifications of the internship supervisor. Alternatively, a group project may occur in lieu of an internship and should provide students with training and experience in performing professional-level work that involves managing group dynamics and applying technical expertise to solve complex, multidisciplinary water related problems.

Students must enroll in a total of 3 credits in the Freshwater 980 Internship course. Your advisor will review proposals. Internship requirements and forms can be found under the MS Professional Science Academic Forms link.
Applying for Graduation

Master’s Graduation Procedures
Follow the [Graduate School steps to graduate](#). [Graduation dates and deadlines](#) must be followed in order to graduate.

Minimum Credit Registration
You must be registered for at least 1 UWM graduate credit (audit not allowed) during the semester your degree is awarded. If you have met all academic requirements and do not need to take another course, you may enroll in course 888, "Candidate for Degree." This course does not add to your credit total, apply to your degree, or affect your GPA. You are assessed the equivalent of one graduate credit in fees and receive a grade of S.

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