Environmental and Water Resources Graduate Program Handbook

2023

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PREFACE

This manual is designed to assist graduate students and faculty in the UMass Environmental and Water Resources Engineering (EWRE) Program. It contains the following information:

***General information about key personnel and faculty in the Department of Civil and Environmental Engineering (CEE) and the EWRE Program;
***Summaries of degree requirements, advising procedures, and Program requirements including forms which must be completed for the M.S. degree program.
***Other EWRE Program information.

The EWRE Program is a graduate program within the Department of Civil and Environmental Engineering. The Department offers and administers three graduate degrees: M.S. and Ph.D. in Civil Engineering and the M.S. in Environmental Engineering. Any of these three degrees may be pursued by eligible students studying environmental and water resources engineering. Specific information regarding requirements for the degrees are described in later sections.

EWRE PROGRAM OBJECTIVES

The faculty have organized the EWRE Program, including its curriculum, course requirements, course content, and research activities to educate and prepare our students for careers in environmental and water resources engineering research and professional practice. The specific objectives of the EWRE Graduate Program are:

1) Program graduates will enter the environmental and water resources engineering profession or continue with PhD level graduate studies.
2) Program graduates will be recognized by supervisors and colleagues as possessing the skills needed to successfully work in the environmental and water resources engineering profession.
3) Program graduates will provide service to society through involvement in professional societies, community groups, charitable organizations or similar activities.
4) Throughout their careers, program graduates will use educational opportunities to continue to expand their understanding and skills in science and engineering for the protection of human health and the environment.

PEOPLE YOU SHOULD KNOW

The Department of Civil and Environmental Engineering main offices are located on the second floor of Marston Hall. Graduate students may interact with the CEE Department Head, CEE Graduate Program Director and Department staff. These individuals are:

- John E Tobiason, Professor and Head, Marston 224 (545-2508)
- Caitlyn Butler, Associate Professor, Graduate Program Director, MS and PhD Programs, Marston 16B (577-0926)
- Jodi G. Ozdarski, Academic Assistant, Grad & Undergrad students, Marston 226 (545-0686).
- Sherrie Webb-Yagodzinski, ELab II Laboratory Manager (577-3231)
- Judy Pierce, Administrative Officer, Marston 235B (545-2567)

EWRE Faculty and Staff

The student-advising faculty in the EWRE Program (as of January 2021) are:

- Konstantinos Andreadis, Assistant Professor, Marston 18C (545-5395)
- Casey Brown, Professor, EWRE Program Coordinator, Marston 12B, (577-2337)
- Caitlyn Butler, Associate Professor, Marston 16B, (545-5396)
- Colin J. Gleason, Assistant Professor, Marston 12A (545-2681)
- Christian Guzman, Assistant Professor, Marston 21 (545-1510)
- Emily Kumpel, Assistant Professor, Marston 16D (545-5390)
- Mariana Lopes, Assistant Professor, Marston 16C (545-5392)
- Richard N. Palmer, Professor, Marston 224 (545-2508)
- Chul Park, Associate Professor, Marston 16A (545-9456)
- David A. Reckhow, Professor, emeritus
- John E. Tobiason, Professor, Marston 21 (545-5397)

GETTING SET UP

Paychecks. Paychecks are deposited directly into student bank accounts. To set up direct deposit in a bank, students should obtain appropriate forms from the Human Resources Office in Whitmore Hall. Statements for automatic deposits will also be sent to the Program office.

Photocopying. For graduate students on research projects, photocopying services are available through the Program office (Marston Hall, Rm. 18) and in ELab II Rm 210. In order to use this service for a research project, you need your advisor's permission and a copying code. Personal copying is strictly limited and is charged at the rate of ten cents per page.

Offices. Students who are funded as teaching or research assistants are assigned an office and a research area (if appropriate) located in either Marston Hall or Engineering Laboratory II (ELAB II) as space allows. Specific room and desk assignments are made by the EWRE Program Coordinator.

Keys. Office keys can be obtained contacting Amy Feliciano in Marston 224. It is important to keep office and lab areas locked during “off hours” (approx. 6 pm to 8 am, Mon-Fri, and on weekends). When leaving office or lab areas, each person should make sure doors are locked. Many doors in ELab II require a key to be unlocked, and require a key to re-lock the door. Please keep doors locked during “off- hours” and assume that doors will be locked (i.e., carry your keys with you). Access to ELab II between 7 pm and 7 am, Monday-Friday, and on weekends is gained by swiping your UMass ID card through readers near the building entrance doors. You must supply Mary Bisbee with your UMass ID number so you can be entered on the list of persons allowed to access the building.

Telephone. Several student office areas have phones. The student phones are for local and long distance calls. Long distance calls are to be made only for University business.

Mailboxes. Memos and notices from staff members, as well as faxes, messages from professors, etc., will be put in the mailboxes. While nearly all memos and notices will be distributed via email, it is important that you check your mailboxes regularly.

Computer Services. Engineering Computing Services (ECS) and UMass Office of Information Technology (OIT) support the research and instructional computing needs of the College of Engineering. ECS installs and maintains all network hardware within the College. ECS operates a cluster of Unix- based computers that operate the mail system and other network functions. These Unix-based computers can be accessed through an ECS account from any computer in the College that is connected to the network. Most EWRE students will use their own personal computers. However, it is essential that all graduate students have a UMass email account to have access to university email. The Program uses email extensively to communicate among staff, faculty and students. The Program has one computer room for use by EWRE students: Marston 12 (Perrell Lab). Please refer to the Computing Facilities section at the end of this document for a complete description of the facilities and procedures to follow in using these facilities.

Laboratories. The Program has several research and teaching laboratories in Marston Hall and ELAB II. The use of these facilities is described in the *Environmental Engineering Research Laboratory Rules and Protocols Manual* which contains information about the program's laboratories.

Responsibilities of Assistantships. Students who receive 20 hours per week of TA or RA support are full-time students (half time in courses and thesis and half time on TA or RA activities). As such, employment outside the Program is highly discouraged. It is also expected that students will remain on- campus while receiving support. The timing and length of vacations or other trips off campus should be approved by your advisor.

DEGREE REQUIREMENTS AND ADVISING

Graduate students in the Environmental and Water Resources Engineering Program may pursue one of three graduate degrees. The Department of Civil and Environmental Engineering offers M.S. and PhD degrees in Civil Engineering (with emphasis in environmental engineering) and the EWRE Program offers the M.S. in Environmental Engineering degree.

The material presented below is provided for the information and guidance of graduate students and their faculty advisors. Regulations governing the degrees come from three levels: the Graduate School, the Department of Civil and Environmental Engineering, and the EWRE Program. Your faculty advisor (see Advising) will assist you in the planning of your graduate degree program so that you meet all requirements; however, the ultimate responsibility lies with the student. Students register for up to 16 credits of coursework via the web-based SPIRE system[1]. In some cases students may need assistance from Jodi Ozdarski to override system controls[2].

There are certain documents/information sources you should have access to so you can meet all requirements. From the Graduate School you should refer to the current online information in the ***Graduate School Bulletin*** and the ***Graduate School Handbook*** . These documents provide information about Graduate School regulations, registration, due dates, thesis and dissertation requirements, etc. In addition the Department of Civil and Environmental Engineering has information available on ***Regulations Governing The M.S. and Ph.D. Programs of the Department of Civil and Environmental Engineering***. The information is available on the CEE Department web site at http://cee.umass.edu/forms-regulations

Academic Honesty. The UMass Academic Honesty Policy applies and can be found in the Code of Student Conduct online at: https://www.umass.edu/honesty/. This policy covers plagiarism, cheating, fabrication and facilitating dishonesty. It is especially important to properly cite and quote sources to refrain from plagiarism, and to recognize standard accepted definitions of plagiarism as defined by UMass, which may differ from definitions of plagiarism as used internationally.

M.S. Degrees

Two M.S. degrees are offered: the M.S. in Civil Engineering and the M.S. in Environmental Engineering. As mentioned earlier, be sure to refer to the documents indicated above for Graduate School and CEE Department requirements.

The M.S. in Environmental Engineering is more closely aligned with the program's roots in process engineering and therefore requires students to have taken at least one graduate level course in this area. The M.S. in Civil Engineering is the degree option that should be taken by students not wishing to study process engineering. In addition to the traditional 2-year research-based option, the program also offers a one-year coursework-based option. This is designed to be completed in 9 to 12 months and students in this program typically do not receive financial assistance from the Program. Students who have been admitted into the Program without an engineering baccalaureate must make up prerequisite coursework at the basic level of

undergraduate engineering in order to be eligible for an MS degree; no graduate credit is granted for this basic level work. Please see your faculty advisor if you have any questions.

Research Option

The graduate course requirements for students in the research-based MS in Environmental Engineering program are described below. All degree candidates must earn a minimum of 31 graduate credits.

Core Courses
The required course for an MS degree is:

Designation	Title	Credits
CEE 691/692	Seminar	1

Master's Project
The student is required to write a research report and present an oral defense before a Master's Committee on a topic determined in consultation with the advisor. The content of the report normally derives from the research conducted by the student as part of their research assistant duties. Six (6) credits, taken as CEE 689, must be earned under the Master's Project and are part of the 31 total credit requirement; more than 6 credits of CEE 689 may be earned, but only 6 credits apply to the 31 credit total required for the M.S .degree. The Master's Committee consists of the student's advisor and at least one other EWRE faculty member.

Electives
In addition to the Core Courses and Master's Project, the student completes a minimum of twenty credits of electives taken in areas relevant to the student's professional objectives. Note that seminar (CEE 691/292) counts as the twenty-first credit required by the graduate school. All elective courses must be taken at the graduate level (500 level or higher). Students may take graduate level electives in other departments at the University; however, no more than 9 graduate credits taken outside the Civil and Environmental Engineering Department can be counted toward the 31 credit requirement.

600 level requirement for thesis option
6 elective credits must be taken at the 600 level.

Transfer Credits
No more than six graduate credits can be transferred from courses taken at another institution. These credits must be at the graduate level and must not have been utilized to have met prior undergraduate or graduate degree requirements.

Coursework Option

This option is similar to the Research Option, but there are some significant differences. It has a 31 credit requirement. Students are able to complete this degree in a 12 month period rather than the 18 to 24 month period which is typical for the research option for a student with a BS in Engineering. This shorter time frame is possible since students are not employed as teaching or research assistants. Financial aid is not offered for this option.

Core Courses
The core courses for the coursework option are the same as those for the research option as described above (total of 1 credits).

Electives and Transfer Credits
There are 30 credits of electives. All electives must be taken at the graduate level. As noted above, *up to 9 credits of graduate level electives may be taken outside of the CEE Department*. Also, up to six credits of graduate level coursework from other institutions may be formally transferred as long as those credits were not required to earn any prior degree.

600 level requirement
Graduate students who do not write a master's thesis must earn a minimum of twelve (12) credits in the 600-800 course level range.

Students with Non-engineering Baccalaureate

To be awarded the degree of Master of Science in Environmental Engineering, students without a BS in engineering degree must make up prerequisite coursework at the undergraduate level; this coursework does not receive graduate credit. The coursework can be completed prior to entering or during the student's UMass MS program. A summary of these prerequisites is shown below and a form for documenting completion of the prerequisites is included in the Appendix of this document.

Required prerequisite courses/subjects for the MS degree program:

- Calculus I
- Calculus II
- Calculus III (multivariate)
- Differential Equations
- Probability & Statistics
- Biology
- Chemistry
- Physics
- Thermodynamics
- Engineering Economics
- Statics
- Fluid Mechanics
- Introductory EWRE course(s)

ONLINE COURSEWORK

Several of our graduate courses are offered in parallel in-person and online sections. In such cases, students in residence must take the 'in-person' section. On an ad hoc basis and with the approval of the student's advisor, the course instructor, and the GPD, a student may take the online version to accommodate a unique circumstance.

PhD DEGREE

The graduate student and advisor should consult and follow the CEE Department website regarding requirements and regulations pertaining to the PhD degree. Information on Degree requirements, Committees, Examinations, etc., is described. In addition to the CEE Department regulations, the Environmental and Water Resources Engineering Program has requirements for the major area, minor area, and research skill that are greater and more comprehensive than the CEE Department, and a specific format for the Ph.D. Comprehensive Examination.

PhD Requirements

UMass graduate school rules apply. The highlights of what is required are

- 18 dissertation research credits (CEE 899)
- Comprehensive exams (see PhD Preliminary Comprehensive Examination)
- Prospectus exam (see Doctoral Dissertation Committee, Prospectus, and Defense)

PhD Coursework requirements

For students entering with a Master's degree in a related field

- If you have earned a Master's in a related field, then you are required to take 1 credit of EWRE seminar (CEE 691A). You are also required to register for seminar every semester you are a full time student
- Your MS will be determined as 'related' or 'not related' by the EWRE program coordinator by the end of your first semester.
- Upon entering the program, you and your advisor will specify a list of courses you are required by your advisor to take. This course list is at the discretion of the advisor, and is different for each student given student background,

experience, and research interests.

- This course list will be written down and signed by the student and the advisor by the end of the student's first semester
- This course list may grow or change in the future pending research results, comprehensive exam results, or changes in student research interests. Amendments to the document will be recorded and resigned by the advisor and advisee.
- This course list is considered binding and must be met for graduation
- This course list will be reviewed at the time of your comprehensive exams. Amendments that occur after the comprehensive exam should also be reviewed by your Dissertation Committee if revised after the prospectus defense.
- This course list must include any classes designed by EWRE faculty as 'essential first semester classes' should they be offered during your time in the program
- Course plans will be kept on file by the EWRE coordinator.

For students without a Master's degree in a related field

- You are required to take 1 credit of EWRE seminar (CEE 691A). You are also required to register for seminar every semester you are a full time student
- You are required to take 24 credit hours of coursework. 12 of these credits must be in the department. You and your advisor will agree on which classes are appropriate.
- Your advisor may require additional coursework. Such a requirement will be stated as a course list described above. These courses may include more credit hours than the minimum required 24.
  - This course list will be written down and signed by the student and the advisor by the end of the first week of the student's first semester
  - This course list may grow or change in the future pending research results, comprehensive exam results, or changes in student research interests. Amendments to the document will be recorded and resigned by the advisor and advisee.
  - This course list is considered binding and must be met for graduation
  - This course list will be reviewed at the time of your comprehensive exams. Amendments that occur after the comprehensive exam should also be reviewed by Dissertation Committee if revised after the prospectus defense.
  - Course plans will be kept on file by the EWRE coordinator.
- These courses must include any classes designed by EWRE faculty as 'essential first semester classes' should they be offered during your time in the program
- Note that enrolling in the PhD program is specific to the PhD and does not automatically enroll you in the MS program- if you also want to earn an MS from EWRE, you must fulfill the MS requirements as outlined in section "M.S. Degrees" and formally declare your interest with the graduate school. If a situation arises where you seek or need to leave the PhD program, you may apply the acquired course credits towards satisfying a MS degree, see section "M.S. Degrees" for more information on those requirements. It is strongly recommended that you meet with your advisor and the GPD before pursuing a degree plan change.

PhD Preliminary Comprehensive Examination.

To become a Ph.D. candidate, all Ph.D. students must pass a Preliminary Comprehensive Examination. This exam is offered each winter and summer (as needed) and consists of written and oral examinations. The Environmental and Water Resources Engineering Program requires a specific format for this exam as described below. For timelines and expected completion, see below.

Written Portion of the Ph.D. Comprehensive Exam

1 year (2 semesters) after start of PhD, students must take written exams. Students may defer this to a later date via agreement of the advisor.

Students answer 3 out of 6 written questions (below). Questions are designed to align with the ERE and WRE sub-disciplines and their content is assigned at the discretion of the EWRE faculty each year. Questions are closed book, 90 minutes per question. Questions are completed in a single day, and exam materials are controlled by the coordinator. Students receive a quantitative grade, and receive written feedback on their exams at least 24 hours prior to an oral defense.

Examining Committee: Students may constitute the exam with any EWRE faculty, but should include their advisor. Traditionally, students choose the faculty who wrote the exam question as exam committee members.

Composition: A six hour, closed book, written exam in which the student answers three questions from the following six subject areas. The composition of the six questions is subject to change at any time.

1. Biological Principles of EWRE
2. Chemical Principles of EWRE
3. Mathematical Methods in EWRE
4. Treatment Processes
5. Hydrology
6. Water Resource Systems

Rules:

- Must pass each exam (total score $\geq$ 70%)
- Exams are in-person, closed book, and taken on the same day.

Oral Portion of the Ph.D. Comprehensive Exam

Schedule: To be taken within two days to one week following completion of the written portion of the PhD Preliminary Comprehensive exam.

Format: The student will respond to oral questions from the committee about the content of the written exams The oral exam is expected to last about two hours. This exam must not be combined with a presentation and defense of the Dissertation Prospectus.

Preparing for oral exams: Students will have two hours to review all four of their written questions. Students must perform this review in a closed room under direct supervision of the exam coordinator. Students may take notes, but all note taking material must remain in the review room. Similarly, no photos or other means of preserving exam information is allowed during this time.

Passing the exams: A passing grade must be earned from all committee members for the overall comprehensive exam (oral and written). The committee may assign the following outcomes: pass, fail, or conditional pass. The committee will account for written and oral performance. If on the first attempt the student fails to pass, the committee will direct the student to re-take the entire comprehensive exam, or portions thereof, within a specified time period after the first attempt. If this second attempt ends in failure, the student will not be allowed to continue in the PhD program.

Doctoral Dissertation Committee, Prospectus, and Defense

The Doctoral Dissertation Committee consists of the student's advisor, at least one other EWRE faculty member, and one graduate faculty member outside of the CEE Department. Note that faculty from other universities may serve on the committee, but do not count as 'outside' members unless they are appointed faculty of the Graduate School of UMass. The Dissertation Committee must approve the candidate's Dissertation Prospectus and the final Dissertation. Note that the examination committee and the Dissertation Committee do not have to be identical.

One year (two semesters) after the Comprehensive Exam, the student shall defend their Prospectus. Students may defer this to a later date via agreement of the advisor. The Prospectus defense must occur at least seven months prior to the Dissertation defense per UMass policy.

There is no set format for the prospectus exam, and students must work with their advisor to set this format and understand any requirements. Common formats include an outline of the dissertation, a mock research grant proposal, or a hypothetical research paper, but these are not exhaustive. Typically, students prepare a presentation to the committee for the prospectus defense. After passing the prospectus defense, students become a Candidate for the degree of Doctor of Philosophy.

Teaching and Service

All of the EWRE Program Ph.D. students are encouraged to obtain teaching experience as part of their education. Each student should talk to their advisor about having the opportunity to present lectures in appropriate courses or to serve as a Teaching Assistant. In addition, the EWRE Program has a philosophy of having everyone work together to help the program. In this regard, both M.S. and Ph.D. students are called upon to help with certain program activities.

ADVISING

This section places emphasis on advising for the M.S. degrees, particularly the M.S. in Environmental Engineering. Students who have enrolled in the PhD program should consult the CEE Department website for information (***Regulations Governing the M.S. and PhD Programs of the Department of Civil and Environmental Engineering)***.

Advisor Definitions. Each student is assigned an Advisor upon admission to the Environmental and Water Resources Engineering Program. The Advisor will advise the student on curriculum matters, course registration, and on the MS Project Report or PhD Dissertation.

Initial Registration. New graduate students upon arrival on campus should schedule an appointment with their Advisor for the purpose of registering for courses for their first semester. It is required that the student with the assistance of the Advisor fill out a plan using the Plan of Study (Appendix A) of how they will fulfill degree requirements for their projected period of study. This plan should be approved by the Advisor and sent to the EWRE Program Coordinator for approval within four weeks of the beginning of the student's first semester on-campus. The purpose of the plan is to insure that all students understand degree requirements and have a plan to satisfy them. It is understood that students and faculty will not always know which courses will be taught in the future, and therefore it will not always be feasible to identify courses with specific semesters. What is important is that students have prepared a plan showing in which semester they intend to take specific courses. Please e-mail Jodi Ozdarski (ozdarski@ecs.umass.edu) to request electronic versions of the forms in Appendix A or download them from the web page (http://cee.umass.edu/cee/graduate/forms-regulations) .

Semester Registration Meetings. Prior to the start of classes each semester, the student should meet with his/her advisor regarding course selection. At this meeting the Plan of Study Form can be updated. As the Form is updated the Advisor should place a current copy in the student's official file which is maintained in the CEE Department office.

Degree Completion Requirements. M.S. and PhD degree students should consult the CEE Department website for procedures to follow and for requirements regarding completion of your degree ***(Regulations Governing the M.S. and PhD Programs of the Department of Civil and Environmental Engineering***). In addition the Environmental and Water Resources Engineering Program has three additional requirements.

M.S. Program Summary Form (Appendix A)

A final completed copy of this form must be prepared and signed by both the student and Advisor. This form should be forwarded to the Graduate Program Director for approval along with the Degree Application/Eligibility Form. Please allow sufficient time for the Graduate Program Director to review this material prior to deadlines established by the CEE Department and the Graduate School. Once approved by the Graduate Program Director, Jodi Ozdarski will forward all necessary documents to the Graduate School.

Graduate Data Information Form (Appendix A) **and Questionnaire**

All students should fill out the Graduate Data Information Form as well as the Graduate Student Questionnaire and leave these with Jodi Ozdarski.

Laboratory and Office Area Clean-up (Appendix A)

The student is responsible for cleaning up his/her laboratory area. This includes glassware and equipment. Your Advisor should go over this item with you and verify its satisfactory completion prior to signing the University's Degree Application/Eligibility Form. This form must also be forwarded to the Graduate Program Director. Personal belongings in your office area should be removed and personal files on any CEE or EWRE Program computers should be deleted. Consult with your advisor regarding the need to back-up research project files.

PROFESSIONAL SOCIETIES

Listed below are a number of professional associations related to the Environmental and Water Resources Engineering field. In addition, a variety of journals are listed which contain environmental engineering and water resources material. To provide an idea of the types of papers found in each, a number of subject areas are listed with each journal. Many of the associations or journals have student membership rates. The reduced fees provide you with an excellent opportunity to join these professional societies or to purchase the journals. The Program encourages membership and the presentation of research results at professional society conferences.

Associations.

AIR AND WASTE MANAGEMENT ASSOCIATION (AWMA) - publishes Journal of the Air and Waste Management Association, Environmental Management (EM) and other books and periodicals.

AMERICAN CHEMICAL SOCIETY (ACS) – highly respected journal of interest is Environmental Science and Technology; chemistry of air, water, soil, etc.

AMERICAN GEOPHYSICAL UNION (AGU) – The world's largest scientific society. Publishes numerous distinguished journals, including Water Resources Research.

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) - has a number of different divisions including Environmental Engineering, Water Resources Planning and Management, and Hydraulics, with associated journals.

AMERICAN SOCIETY FOR MICROBIOLOGY (ASM) - publishes Applied Environmental Microbiology.

AMERICAN WATER RESOURCES ASSOCIATION (AWRA) – professional association dedicated to advancements in water resources management, research, and education

AMERICAN WATER WORKS ASSOCIATION (AWWA) – North American association focused on all aspects of drinking water. Regional organization is the New England Water Works Association.

INTERNATIONAL WATER ASSOCIATION (IWA) – international association covering all aspects of water (drinking, storm, wastewater) publishes Water Research, Aqua and other books and periodicals.

NATIONAL GROUND WATER ASSOCIATION (NGWA) - publishes groundwater journals.

WATER ENVIRONMENT FEDERATION (WEF) – North American association focused on wastewater and stormwater. Regional organization is the New England Water Environment Association; publishes Water Environment Research and Water Environment and Technology.

Journals .

- Applied Environmental Microbiology (ASM)
  - environmental microbiology; microbiology of water; wastewater microbiology

- Environmental Engineering Science
  - all aspects of environmental engineering
- Environment International
  - water quality; water treatment; water resources
- Environmental Science & Technology (ACS)
  - air and water pollution control processes, aquatic and atmospheric chemistry, water resources, solid wastes, hazardous wastes
- Environmental Technology
  - all areas of environmental technology and pollution
- Environmental Toxicology and Chemistry (SETAC)
  - all aspects of environmental toxicology and chemistry
- Groundwater (NGWA)
  - groundwater quality and quantity
- Groundwater Monitoring and Remediation (NGWA)
  - groundwater monitoring; groundwater contamination and cleanup
- Journal Air and Waste Management Association (AWMA)
  - air quality; air pollution control
  - solid and hazardous waste management
  - environmental remediation
- Journal American Water Works Association (AWWA)
  - water supply and treatment
- Journal of Environmental Engineering (ASCE)
  - all areas of environmental engineering are covered
- Journal of Environmental Quality (SSSA)
  - unsaturated zone contamination
  - phytoremediation
  - pesticide/herbicide fate and transport
- Journal of Hydraulic Engineering (ASCE)
  - hydraulics of engineered and natural systems
- Journal of the American Water Resources Association (AWRA)
  - management and planning for water resources; hydrology
  - prior to 1997, known as Water Resources Bulletin
- Journal of Water and Health (IWA)
  - relatively new international journal with broad coverage
- Journal of Water Resources Planning and Management (ASCE)
  - modeling and optimization techniques for water resources
- Journal of Water Supply: Research and Technology – AQUA (IWA)
  - water supply and water quality; water treatment; water distribution
- Microbial Ecology (ISME)
  - environmental microbiology; microbial ecology; biological treatment
- Soil Science Society of America Journal (SSSA)
  - soil physics, chemistry and microbiology
- Water Environment and Technology (WEF)
  - general information and news, wastewater & stormwater oriented
- Water Environment Research (WEF)
  - wastewater treatment, environmental microbiology, industrial wastes, water pollution
- Water Research (IWA)
  - water quality and pollution; wastewater treatment
- Water Resources Research (AGU)
  - management, planning, math modeling, and programming for water resources surface and groundwater hydrology
- Water Science & Technology (IWA)
  - water quality and pollution; water treatment
- Water Well Journal (NGWA)

- written from the well drilling industry perspective

COMPUTING FACILITIES

A wide variety of computing facilities are used by EWRE Program Graduate students. Students may use their own PC (desktop or laptop) with access to UMass Office of Information Technology (OIT) and College of Engineering Engineering Computer Services (ECS) networks via hardwire ports in ELab 2 or via wireless network connections. Access to the ECS network requires completion of forms available in the ECS Main office in Marcus Hall. Some students are supplied with, and/or have access to, a PC as part of their research work, either at an office desk or within a research laboratory. Availability generally depends on the nature of the research and budgeted funds; consult with your advisor.

Students in the EWRE Program can make use of computers located in 12 Marston Hall, the Perrell Lab, as described below. Also, ECS and OIT maintain computers in other rooms around campus. ECS facilities include PCs in Marston 112, Marston 134 and Elab 306 which are linked to ECS servers and the Internet. Access to these machines requires an account on either the ECS system or the OIT system. Also, wireless internet access is available through ECS and OIT at an increasing number of campus locations.

Marston Hall 12 Computer Room (Perrell Lab)

The Perrell Lab is available for use by undergraduate and graduate students in the Department of Civil and Environmental Engineering. The Lab contains nine computers with full access to the Internet and a server. Input/output devices available in the lab include a scanner, laser printer, color laser printer and color plotter.

Access to Marston 12 requires knowledge of the keypad code. Please see Jodi Ozdarski to obtain the code. The computers in Marston 12 are linked to the ECS network, so access is via your ECS username and password.

Supplies and Maintenance

The need for toner and observations of hardware or software problems should be brought to the attention of ELab II Lab Manager Sherrie Webb-Yagodzinski or the EWRE Program Coordinator. You may also contact ECS staff who provide support for both software and hardware problems on our computers.

The computer room and computers need regular cleaning and maintenance. Please use common sense with regards to cleanliness and food around the computer and printers.

Software

There is a variety of software available on the computers in Marston 12. This includes the Microsoft Office suite and such engineering packages as Fortran compilers, SigmaPlot and AutoCAD. Copying of software, except public domain software, is illegal. It is the policy of the Civil and Environmental Engineering Department and EWRE Program that only software obtained legitimately with proper licensing may be used on Department computers.

Personal software and data should not be copied onto the hard disk drives of the PCs. Please utilize CDs, flash memory or zip disks for your own work and delete any unnecessary files from the hard disks.

ELab II Printing

The CEE Department maintains a printer/copier/scanner machine in ELab II Rm 210 (EWRE office area). This machine is accessed via the ECS network for printing and scanning. You will be supplied with information needed to download appropriate drivers to utilize the printing and scanning functions. The machine is also a standard photocopier. You must utilize an appropriate ID number as supplied by your advisor. The ID number is specific to your advisor and/or research project. The machine is not for personal use.

APPENDIX A – PROGRAM FORMS

University of Massachusetts - Department of Civil and Environmental Engineering
Environmental and Water Resources Engineering Graduate Program

PLAN OF STUDY
PhD Program

Student:
Student No.:
Semester Entered Program:
Prior degree(s) and institution:

Expected Degree Completion Date:
Advisor:

COURSE NUMBER AND TITLE	CREDIT
Semester 1	
Semester 2	
Semester 3	
Semester 4	
Semester 5 (if needed)	
Semester 6 (if needed)	
TOTAL CREDITS	**24**

Student sign and date:

Advisor sign and date:

UMass Amherst CEEE
EWRE Grad Program

Program Summary (for students entering Sept 2021 or later)
MS Degree program

Student: Degree completion date:

SPIRE ID: Advisor:

Semester Entered Program: THESIS OPTION ___

Prior degree(s) and institution(s): COURSE OPTION ___

COURSE NUMBER AND TITLE	CREDITS	SEMESTER TAKEN	GRADE
CEE 691/692 Seminar (1 credit)	1		
TOTAL			
REQUIRED	**31**		

___ THESIS: at least 6 credits of electives at 600 or higher
___ NON THESIS: at least 12 credits of electives at 600 or higher
___ ALL: maximum of 9 credits outside CEE
___ MS Environmental Engineering (Requires CEE 671 or 672)
___ MS Civil Engineering
___ Fish Passage Engineering (Letter of specialization). CEE 560, 561 or 577, 597F, 4add. Credit

FINAL APPROVAL
Student _____ Date_____ Coordinator _____ Date_____

Advisor _____ Date_____

University of Massachusetts – Department of Civil and Environmental Engineering Environmental and Water Resources Engineering Graduate Program

PLAN OF STUDY FOR SATISFYING MS PROGRAM PREREQUISITES

FOR STUDENTS WITHOUT a prior BS in Engineering Degree

This form is to be completed within one month of entering Program by students who do not possess an undergraduate engineering degree.

Student: Prior Degree/Institution:

Prerequisite General Course/Subject Description	**Course Number(s) & Institution**	**Semester Taken or Planned**
Calculus I		
Calculus II		
Calculus III (multivariate)		
Differential Equations		
Probability & Statistics		
Biology		
Chemistry		
Physics		
Thermodynamics		
Engineering Economics		
Statics		
Fluid Mechanics		
Introductory EWRE course(s)		

PLAN APPROVAL (submit within 1 month)

Student Sign _____ and date

Advisor's Sign. _____ and date

Prog. Coord. Sign. _____ and date

University of Massachusetts Dept. of Civil and Environmental Engineering Environmental and Water Resources Engineering Graduate Program

Course Planning Form – Chronological Basis

Student: _____ Program Entry Semester: _____

Semester:		**Semester:**	
Course No. & Title	**Credits**	**Course No. & Title**	**Credits**
Semester:		**Semester:**	
Course No. & Title	**Credits**	**Course No. & Title**	**Credits**
Semester:		**Semester:**	
Course No. & Title	**Credits**	**Course No. & Title**	**Credits**

GRADUATE DATA INFORMATION FORM

Name:

Thesis/Project/Report Title:

Advisor:

Date of Defense:

Initial Position: (Title/Address/Phone Number)

Forwarding Address:

UMass Amherst Department of Civil and Environmental Engineering

Form CEE.9 - Graduate Student Final Check-Out List

Graduate Student Check-Out List

Student Name and Number _____

Degree Achieved/Area _____ 1.

Degree Eligibility Form Completed: _____

2. Degree Eligibility Form Approved by Chairperson: _____ 3.

Key(s) turned in: _____

4. Project/Thesis/Report/Dissertation submitted: (date)_____ 5.

Library books turned in: _____ 6.

Area/Professors personal books returned: _____ 7a. Study

area cleaned:_____Room #_____Desk # _____

7b. Lab area cleaned:_____Room #_____**Advisor's Initial**_____

7c. Computer files removed: :_____Room #_____**Advisor's Initial**_____

8. All "incomplete" grades changed: _____ 9.

Forwarding address: _____

_____

SIGNED:

_____ Date:_____
Student - Items 5,6,9

_____ Date:_____
Key Return – Item 3

Date: _____
Academic Assistant - Items 1,2,4,7,8