



TEXAS A&M  
UNIVERSITY

# **Water Resources Engineering Graduate Student Handbook**

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*Zachry Department of Civil Engineering*

*2009-2010*



# Table of Contents

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Overview .....	4
Program Overview .....	5
Faculty Members.....	6
Degree Programs.....	7
Degree of Master of Engineering .....	8
Degree of Master of Science .....	11
Doctor of Philosophy.....	14
Graduate Coursework .....	17
Funding Opportunities .....	19
Research Assistantships.....	20
Teaching Assistantships.....	20
Fellowships .....	20
Tuition Waivers & In-state Tuition .....	20
Additional Information .....	21
Full-Time Enrollment.....	22
Mailboxes.....	<b>Error! Bookmark not defined.</b> 27
Academic Probation.....	23
Frequently Asked Questions.....	24

# Overview

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## *Program Overview*

Water resources engineering has its roots in the tasks of supplying water for human use, removing water when humans are finished using it, and developing methods of avoiding damage from excess water (floods). Much of the work of water resource engineers involves the planning and management of constructed facilities that address these tasks. Positions for undergraduates and graduates who specialize in water resources engineering can be found in both engineering consulting firms and in government entities charged with supplying water or dealing with its hazards.

We offer a range of courses that address the training of a water resources engineer. At the undergraduate level, we offer a general water resources junior-level course that most undergraduates take for a basic knowledge of water resources. Our senior-level electives cover hydrology, hydraulics, and storm water management, and feature extensive use of computer programs used in engineering practice.

At the graduate level, we again offer core courses in hydrology and hydraulics, and more specialized courses in areas such as groundwater, water resources planning and management, GIS applications to water resources, and stochastic hydrology.

Research areas of our faculty include:

- Application of GIS technology to hydrologic modeling
- Water Rights Allocation modeling and decision support system
- Groundwater contaminant transport
- Irrigation planning optimization
- Water supply system safety
- Stochastic hydrology
- Evaporation, and hydrometeorology

## *Faculty Members*

### Administration

<i>Interim Department Head:</i>	John Niedzwecki
<i>Assoc. Dept. Heads:</i>	Jose Roesset,, Roger Smith
<i>Division Head:</i>	Francisco Olivera

### Water Resources Engineering Faculty

Name	Phone	Email
<a href="#">Brumbelow, Kelly</a>	979-458-2678	<a href="mailto:kbrumbelow@civil.tamu.edu">kbrumbelow@civil.tamu.edu</a>
<a href="#">Cahill, Anthony</a>	979-862-3858	<a href="mailto:tcahill@civil.tamu.edu">tcahill@civil.tamu.edu</a>
<a href="#">Chinn, Timothy</a>	979-845-3011	<a href="mailto:tchinn@civil.tamu.edu">tchinn@civil.tamu.edu</a>
<a href="#">Miller, Gretchen</a>	979-862-2581	<a href="mailto:gmilller@civil.tamu.edu">gmiller@civil.tamu.edu</a>
<a href="#">Olivera, Francisco</a>	979-845-1404	<a href="mailto:folivera@civil.tamu.edu">folivera@civil.tamu.edu</a>
<a href="#">Singh, Vijay P.</a>	979-845-7028	<a href="mailto:vsingh@tamu.edu">vsingh@tamu.edu</a>
<a href="#">Wurbs, Ralph</a>	979-845-3079	<a href="mailto:ralph@civil.tamu.edu">ralph@civil.tamu.edu</a>
<a href="#">Zechman, Emily</a>	979-845-2875	<a href="mailto:ezechman@civil.tamu.edu">ezechman@civil.tamu.edu</a>

# Degree Programs

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## *Degree of Master of Engineering*

The Master of Engineering (M.E.) degree requires 30 credit hours of coursework. This non-thesis degree also requires a professional report whose content is determined by the advisory committee. This report can include results of research conducted by the student, or it can be a report written for a specific course or as part of CVEN/OCEN 685 - Directed Studies.

NOTE: All documents requiring departmental signatures must be submitted to the Civil Engineering Graduate Office at least one day prior to the Office of Graduate Studies deadline.

In addition to fulfilling the University requirements for the Master of Engineering (M.E.) degree, a student enrolled in the Civil Engineering graduate program in the area of Water Resources Engineering must satisfy the following department requirements:

- No more than 3 hours of CVEN 685 (within the 6 hours allowed for CVEN 684 / CVEN 685).
- A minimum of 15 hours must be CVEN/OCEN/MEMA coursework (exclusive of CVEN 681, CVEN 684, and CVEN 685).
- A minimum of 241 hours must be taken from course offerings of the following colleges: Engineering2 Geosciences, and Science.
- A maximum of 9 hours of advanced undergraduate coursework (must be 400-level if CVEN/OCEN/MEMA courses).
- A minimum of 18 hours of graduate level coursework taken at Texas A&M University (excluding CVEN 684 and CVEN 685).
- The combination of CVEN 684, CVEN 685, transfer credit, and permissible undergraduate coursework may not exceed the greater of 12 hours or one-third (1/3) of the total hours on the degree plan.



The following area requirements and/or recommendations<sup>3</sup>:

- Recommended Coursework:

CVEN 423 Geomatics for Civil Engineers

CVEN 455 Urban Stormwater Management

CVEN 458 Hydraulic Engineering

CVEN 463 Hydrology

CVEN 627 Engineering Surface Water Hydrology

CVEN 628 Advanced Hydraulic Engineering

CVEN 658 Civil Engineering Applications of GIS

CVEN 664 Water Resources Engineering Planning and Management

CVEN 665 Water Resources Systems

CVEN 673 Transport Phenomena in Porous Media

CVEN 674 Groundwater Engineering

CVEN 675 Stochastic Hydrology

CVEN 681 Seminar in Environmental and Water Resources Engineering

Relevant CVEN, OCEN, MEMA, and other Graduate Courses per recommendations of the advisory committee and department requirements

- Degree Plan: An advisory committee must be formed and a Degree Plan must be submitted and approved by the advisory committee by the end of the first semester of study.

- Completion of Professional Report: A draft Professional Report must be submitted to the advisory committee chair at least 2 weeks (10 working days) prior to revision and subsequent submittal to other members of advisory committee. These other members of the

advisory committee will be provided at least 2 weeks (10 working days) to review the revised draft Professional Report prior to the Final Presentation. Thus, the draft Professional Report must be submitted to the advisory committee chair at least 4 weeks (20 working days) prior to the Final Presentation.

- Final Presentation: A Final Presentation consisting of an oral examination will be scheduled with all of the advisory committee members. At this examination, the student will give a presentation of the content of the Professional Report completed for the degree.

1. 3 of these 24 hours may be outside of colleges of Engineering, Geosciences, and Science if selected from a list of courses approved by the student's specialty area as outlined by the specialty area's documented course work requirements.

2. Certain courses within the College of Engineering are prohibited from use on the degree plan unless written justification is made by the student's advisor and approved by the Departmental Graduate Advisor prior to enrolling in the course. Please see Departmental Graduate Advisor for listing of prohibited courses.

3. All coursework should be discussed with advisory committee chair before enrolling in course. All coursework must be consistent with the student's chosen field of study and commensurate with graduate study.

## *Degree of Master of Science*

The Master of Science (M.S.) degree requires 32 credit hours of approved courses and research. At least 25 credit hours must be coursework, and a thesis.

NOTE: All documents requiring departmental signatures must be submitted to the Civil Engineering Graduate Office at least one day prior to the Office of Graduate Studies deadline.

In addition to fulfilling the University and requirements for the Master of Science (M.S.) degree, a student enrolled in the Civil Engineering graduate program in the area of Water Resources Engineering must satisfy the following department requirements:

- A minimum of 15 hours must be CVEN/OCEN/MEMA coursework (exclusive of CVEN 681 and CVEN 691).
- A minimum of 24 hours must be taken from course offerings of the following colleges: Engineering2, Geosciences, and Science.
- A maximum of 9 hours of advanced undergraduate coursework (must be 400-level if CVEN/OCEN/MEMA courses).
- A minimum of 18 hours of graduate level coursework taken at Texas A&M University (excluding CVEN 691).
- A maximum of 7 hours of CVEN 691 or combination of CVEN 691 and CVEN 685.
- The combination of CVEN 691, CVEN 685, transfer credit, and permissible undergraduate coursework may not exceed the greater of 12 hours or one-third (1/3) of the total hours on the degree plan.

The following area requirements and/or recommendations<sup>3</sup>:

- Recommended Coursework:  
CVEN 423 Geomatics for Civil Engineers  
CVEN 423 Geomatics for Civil Engineers  
CVEN 455 Urban Stormwater Management  
CVEN 458 Hydraulic Engineering  
CVEN 463 Hydrology  
CVEN 627 Engineering Surface Water Hydrology

CVEN 628 Advanced Hydraulic Engineering  
CVEN 658 Civil Engineering Applications of GIS  
CVEN 664 Water Resources Engineering Planning and Management  
CVEN 665 Water Resources Systems  
CVEN 673 Transport Phenomena in Porous Media  
CVEN 674 Groundwater Engineering  
CVEN 675 Stochastic Hydrology  
CVEN 681 Seminar in Environmental and Water Resources Engineering

Relevant CVEN, OCEN, MEMA, and other Graduate Courses per recommendations of the advisory committee and department requirements

- Degree Plan: An advisory committee must be formed and a Degree Plan must be submitted and approved by the advisory committee by the end of the first semester of study.
- Research Proposal: A draft Research Proposal must be submitted to the advisory committee chair at least 2 weeks (10 working days) prior to revision and subsequent submittal to other members of advisory committee. These other members of the advisory committee will be provided at least 2 weeks (10 working days) to review the revised draft Research Proposal prior to the end of the second semester of study. Thus, the draft Research Proposal must be submitted to the advisory committee chair at least 4 weeks (20 working days) prior to end of the second semester of study.
- Completion of Thesis: A draft Thesis must be submitted to the advisory committee chair at least 2 weeks (10 working days) prior to revision and subsequent submittal to other members of advisory committee. These other members of the advisory committee will be provided at least 2 weeks (10 working days) to review the revised draft Thesis prior to the Final Defense. Thus, the draft Thesis must be submitted to the advisory committee chair at least 4 weeks (20 working days) prior to the Final Defense.
- Final Defense: A Final Defense consisting of an oral examination will be scheduled with all of the advisory committee members. At this examination, the student will give a presentation of the research work completed for the degree and documented in the Thesis.

1. 3 of these 24 hours may be outside of colleges of Engineering, Geosciences, and Science if selected from a list of courses approved by the student's specialty area as outlined by the specialty area's documented course work requirements.
2. Certain courses within the College of Engineering are prohibited from use on the degree plan unless written justification is made by the student's advisor and approved by the Departmental Graduate Advisor prior to enrolling in the course. Please see Departmental Graduate Advisor for listing of prohibited courses.
3. All coursework should be discussed with advisory committee chair before enrolling in course. All coursework must be consistent with the student's chosen field of study and commensurate with graduate study.

## *Doctor of Philosophy*

The Doctor of Philosophy (Ph.D.) degree requires 64 credit hours of approved courses and research beyond the Master of Science (M.S.) degree [96 credit hours beyond the Bachelor of Science (B.S.) degree], and a dissertation.

NOTE: All documents requiring departmental signatures must be submitted to the Civil Engineering Graduate Office at least one day prior to the Office of Graduate Studies deadline.

In addition to fulfilling the University requirements for the Doctor of Philosophy (Ph.D.) degree, a student enrolled in the Civil Engineering graduate program in the area of Water Resources Engineering must satisfy the following department requirements:

- A minimum of 32 credit hours of graduate level coursework taken through Texas A&M University<sup>1</sup> (a minimum of 24 credit hours if the student already has taken at least another 24 credit hours of graduate course work for the Master of Science (M.S.) or Master of Engineering (M.E.) degree)
- Remaining coursework requirement can be met by 32 hours of CVEN 691

The following area requirements and/or recommendations<sup>2</sup>:

- Recommended Coursework:  
CVEN 423 Geomatics for Civil Engineers  
CVEN 423 Geomatics for Civil Engineers  
CVEN 455 Urban Stormwater Management  
CVEN 458 Hydraulic Engineering  
CVEN 463 Hydrology  
CVEN 627 Engineering Surface Water Hydrology  
CVEN 628 Advanced Hydraulic Engineering  
CVEN 658 Civil Engineering Applications of GIS  
CVEN 664 Water Resources Engineering Planning and Management  
CVEN 665 Water Resources Systems  
CVEN 673 Transport Phenomena in Porous Media  
CVEN 674 Groundwater Engineering  
CVEN 675 Stochastic Hydrology  
CVEN 681 Seminar in Environmental and Water Resources Engineering

Relevant CVEN, OCEN, MEMA, and other Graduate Courses per recommendations of the advisory committee and department requirements

- **Qualifying Exam:** During the first semester of study, an oral Qualifying Exam will be scheduled with members of the Civil Engineering Water Resources faculty and a Civil Engineering faculty member outside the Water Resources area. The exam should be taken within the first two semesters of study. At this examination, the student will give a presentation of research work completed for a previous degree and questions can cover material addressed in the required coursework for the Water Resources area.
- **Degree Plan:** An advisory committee must be formed and a Degree Plan must be submitted and approved by the advisory committee after passing the Qualifying Exam and by the end of the fourth semester of study.
- **Written Preliminary Exam:** After completion of the coursework listed on the Degree Plan (with the exception of CVEN 691 Research), a Written Preliminary Exam will be scheduled with members of the advisory committee. This exam consists of written questions from the advisory committee. Each question should be given over a period of one day, and the exam in total should be given over a period of one week.
- **Research Proposal:** A draft Research Proposal must be submitted to the advisory committee chair at least 2 weeks (10 working days) prior to revision and subsequent submittal to other members of the advisory committee. These other members of the advisory committee will be provided at least 2 weeks (10 working days) prior to the Oral Preliminary Exam to review the revised draft Research Proposal. Thus, the draft Research Proposal must be submitted to the advisory committee chair at least 4 weeks (20 working days) prior to the Oral Preliminary Exam.
- **Oral Preliminary Exam:** After passing the Written Preliminary Exam, an Oral Preliminary Exam will be scheduled with members of the advisory committee. At this examination, the student will give a presentation of the Research Proposal. The questions in this exam will cover the Written Preliminary Exam, the Oral Preliminary Exam presentation, and any relevant coursework.
- **Completion of Dissertation:** A draft Dissertation must be submitted to the advisory committee chair at least 3 weeks (15 working days) prior to revision and subsequent submittal to other members of advisory committee. These other members of the advisory committee will be provided at least 2 weeks (10 working days) to review the revised draft Dissertation prior to the Final Defense. Thus, the draft Dissertation must be submitted to the advisory committee chair at least 5 weeks (35 working days) prior to the Final Defense.
- **Final Defense:** A Final Defense consisting of an oral examination will be scheduled with all of the advisory committee members. At this examination, the student will give a presentation of the research work completed for the degree and documented in the Dissertation.

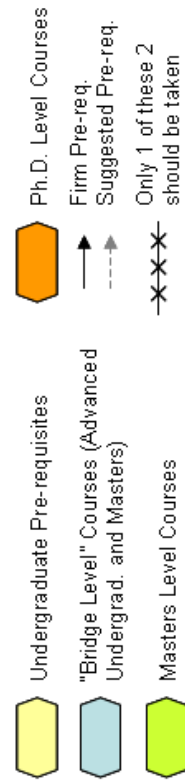
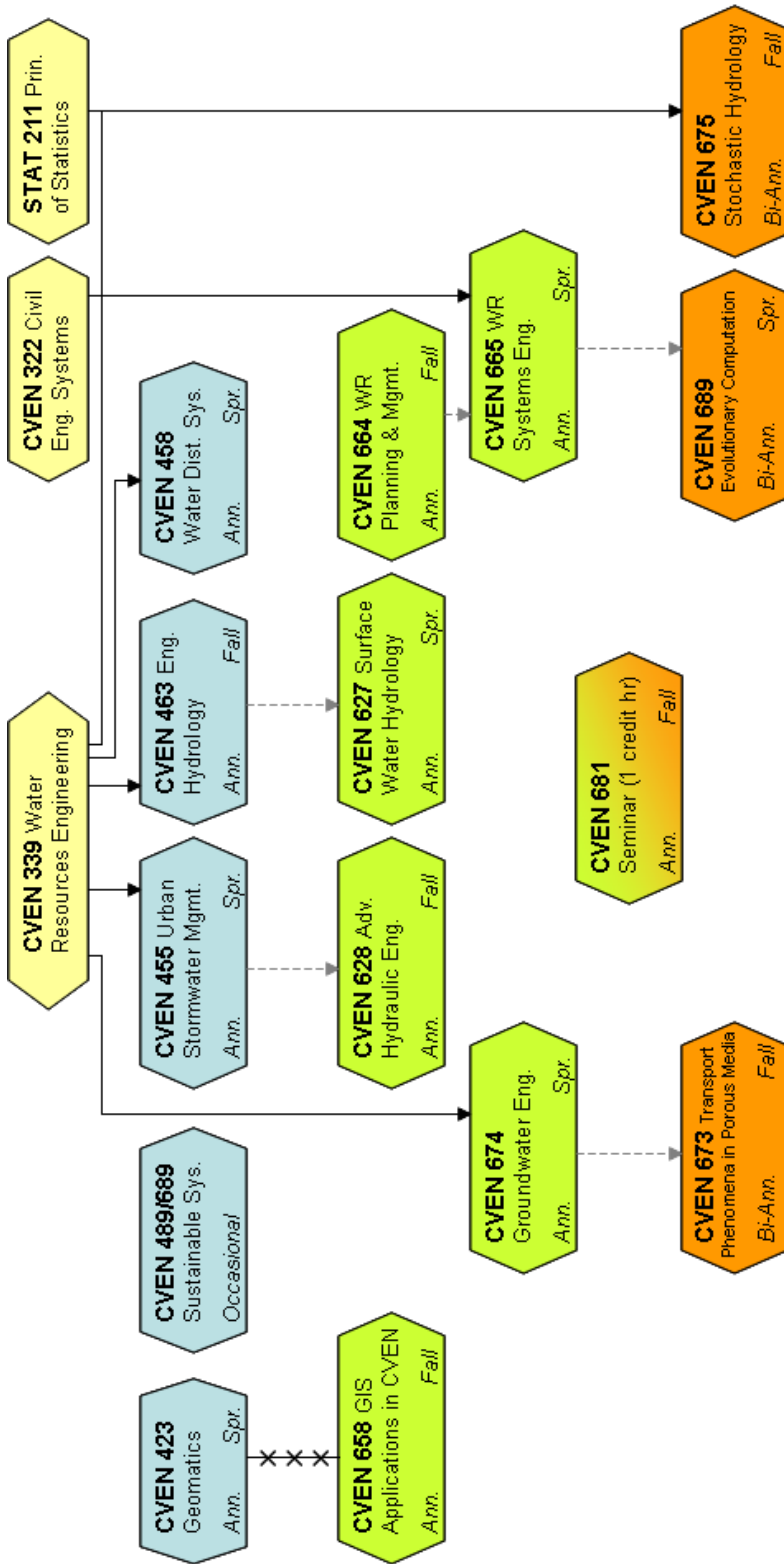
1 Certain courses within the College of Engineering are prohibited from use on the degree plan unless written justification is made by the student's advisor and approved by the Departmental Graduate Advisor prior to enrolling in the course. Please see Departmental Graduate Advisor for listing of prohibited courses.

2 All coursework should be discussed with advisory committee chair before enrolling in course. All coursework must be consistent with the student's chosen field of study and commensurate with graduate study.



# Graduate Coursework

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**Graduate Course Structure (Fall 2009)**  
**Water Resources Engineering Program**  
**Zachry Department of Civil Engineering**



# Funding Opportunities

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## ***Research Assistantships***

Research Assistantship (RA) positions are offered through individual faculty members. There is no centralized list of available positions. You'll need to set-up appointments to meet with them individually. You are **strongly** recommended to through our department's web site to identify the different research areas each professor is working in before meeting with them.

## ***Teaching Assistantships***

New students are automatically considered for the small number of available positions based on their graduate application package. For all other students, a call for those interested in TA positions for future semesters will typically occur around the 10<sup>th</sup> week of the semester. Please wait for the email announcement and/or posted fliers announcing that TA applications.

If you are an international student, you must have satisfactorily passed the ELPE exam before being considered for a TA position.

## ***Fellowships***

Fellowships are typically awarded to incoming students, and there is no formal application process. Any request for fellowships must come from your research advisor, who is recommending you for this award, to Dr. Kelly Brumbelow, who coordinates those awards for our group.

## ***Tuition Waivers & In-state Tuition***

Tuition waivers do not exist by themselves – Research and Teaching Assistantship positions will include coverage of your tuition. Additionally, you can qualify for in-state tuition if you were awarded a Fellowship.

# Additional Information

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## *Full-Time Enrollment*

Required credit hours to be certified as a full-time are:

- Fall and Spring semesters           9 hours
- 10-week summer semester:           6 hours

Graduate students may be certified as full time with fewer than the required hours under special circumstances, including:

- During their final semester before graduation;
- Presence of a documented disability that mandates a reduced course load

These exceptions may or may not apply to a student's eligibility for certain types of financial aid. Students who have questions about how exceptions to the full time enrollment requirements will affect their scholarships, loans, grants, etc., should confer with their financial aid counselor.

In most cases, international students are eligible for the same exceptions to full time requirements; however, all international students requesting an exception to full time requirements must have their request approved by International Student Services. Students who are not U.S. citizens, but who are permanent U.S. residents (VISA TYPE = IM) are not required to clear with ISS on enrollment exceptions.

A student who is enrolled in less than a full-time course of study at Texas A&M may be in jeopardy of:

- being out of compliance with the Bureau of Citizenship and Immigration Services (formerly INS) if enrolled at Texas A&M on a student visa;
- losing their Research or Teaching Assistantship position
- losing insurance coverage under his or her parent/guardian's insurance policy;
- being placed on a loan repayment schedule by a lender or guarantor if the student is the recipient of Federal financial aid; and/or
- losing a scholarship if the guidelines for receiving the scholarship require full-time enrollment, etc.

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## ***Academic Probation***

Graduate students must maintain 3.0 GPR. This requirement includes courses in degree plan as well as all graduate courses taken. If a course is repeated, the last grade received will be the one utilized in GPR calculation. If a student's GPR falls below 3.0, the student will need to meet with their graduate advisor to set out a plan to raise GPR to above 3.0 within one semester. Under extenuating circumstances, a second semester may be allowed for the student to raise their GPR.

Once a plan has been devised, it will be forwarded to the main CE Graduate Office. If the student fails to raise their GPR, they will be removed from the structural engineering graduate program.

# Frequently Asked Questions

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Please see <http://ceprofs.tamu.edu/kbrumbelow/GradAdv/> for further information and answers to frequently asked questions.