



UNIVERSITY OF  
ARKANSAS

COLLEGE OF  
ENGINEERING

2014  
2015

Civil Engineering Graduate Student

# HAND BOOK

Not all Engineers are *Civil*

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## WHY THIS HANDBOOK?

The purposes of this Graduate Student Handbook are to:

- Help prospective students understand what is involved in a graduate program;
- Provide information about the Civil Engineering Graduate Programs, course requirements, and procedural matters.

This handbook supplements the Graduate School Catalog and other materials provided by the Graduate School and the College of Engineering.

As a core of its mission, the University of Arkansas provided students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail.

- Each University of Arkansas student is required to be familiar with and abide by the University's Academic Integrity Policy which may be found at <http://provost.uark.edu/>. Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor.

The Civil Engineering Department offers two Masters of Science graduate programs:

- Master of Science in Civil Engineering (MSCE)
- Master of Science in Environmental Engineering (MSEnE)

These programs are designed to:

- Broaden a student's knowledge of the principles and practices of Civil Engineering;
- Allow a student to develop a level of specialization in one aspect of Engineering practice;
- Expose a student to testing, design, and analytical procedures through hands-on research activities;
- Improve a student's report writing and oral presentation skills

A coursework-only Master of Science in Engineering (MSE) degree is offered only to students pursuing the degree through distance education. The MSE program is administered through the College of Engineering.

The Civil Engineering Department also offers the Doctoral (Ph.D.) degree. This degree is research oriented and designed to teach the individual how to explore new frontiers in Civil Engineering, organize and conduct an intensive research study in a specific problem area, and compile and organize data and its analysis in a form suitable for publication in circulated literature. The Ph.D. candidate is expected to be capable of independent scholarly study and to possess the ability to further engineering practice through research and other creative pursuits.

The MSCE and the Ph.D. programs that we offer typically emphasize one of the following areas:

- Environmental Engineering
- Geotechnical Engineering
- Structural Engineering
- Transportation Engineering

MESSAGE FROM THE DEPARTMENT HEAD



*Kevin Hall, Ph.D., P.E.*  
Professor; Department Head;  
21<sup>st</sup> Leadership Chair in Civil Engineering

Welcome to the University of Arkansas graduate program in Civil Engineering.

An advanced degree is becoming increasingly important to the practice of engineering and should be very valuable to you in your career.

We are devoted to providing a solid academic experience so that your degree will be of maximum benefit to you.

We look forward to working with you throughout your degree program. If you run into difficulties and we can be of assistance, please do not hesitate to ask.

MEET THE FACULTY

Environmental



FINDLAY EDWARDS



JULIAN FAIREY



RODNEY WILLIAMS



WEN ZHANG

Geotechnical



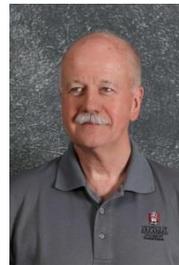
MICHELLE BERNHARDT



RICK COFFMAN



NORM DENNIS



MIKE JOHNSON



CLINT WOOD

Structural



MICAH HALE



ERNIE HEYMSFIELD



GARY PRINZ



PANNEER SELVAM

Transportation



NATALIE BECKNELL



ANDREW BRAHAM



JIM GATTIS



KEVIN HALL



STACY WILLIAMS

## REQUIREMENTS TO ENROLL IN A GRADUATE PROGRAM

To be considered for regular admission to graduate standing, applicants must comply with all general requirements of the Graduate School. In addition to the general Graduate School requirements, applicants must meet the following specific requirements to be accepted for graduate study in the Department of Civil Engineering.

When evaluating applicants for graduate programs, the factors considered include:

- the applicant's grades in their previous University classes;
- GRE (Graduate Record Examination) verbal, quantitative, and analytical scores;
  - minimum required GRE score for the department is: Old Score (Quantitative + Verbal-1100 & Writing 3.5) and new score (Q + V = 302 and WR = 3.5)
- for foreign applicants, TOEFL (Test of English as a Foreign Language) scores as required by the Graduate School;
- Statement of purpose and/or research area of interest to be sent to the CVEG graduate coordinator or graduate admissions with the application document.

### Undergraduate Degree Requirements

Applicants possessing an ABET-accredited (ABET, Inc. accredits US university engineering programs) undergraduate engineering degree and applicants with a non-ABET accredited engineering degree from a foreign university are usually accepted.

Applicants who do not have an undergraduate engineering degree are not accepted into the Master of Science in Civil Engineering or Master of Science in engineering programs. However they can be accepted into the Master of Science in Environmental Engineering program on the condition that they satisfy all prerequisite and degree requirements. In all cases, a student's major adviser and graduate study committee may identify topics that were not included in a student's undergraduate or other previous programs that will require additional study.

### Transfer of Credit from Other Universities

A Masters or a Ph.D. student may apply to receive transfer credit for one or more classes from another recognized graduate school in the United States, provided the class grade was B or better, all residency requirements have been met, and the student's Graduate Program of Study Committee approves. Graduate courses taken at Graduate Residence Centers of the University of Arkansas System may be transferred to a Masters or a Ph.D. program.

Master's Degree candidates may transfer up to 6 semester credit hours of graduate course work. Courses Taken through Graduate Residence Centers may not be used to satisfy residency requirements for the Ph.D. degree in Engineering.

## FINANCIAL ASSISTANCE: SCHOLARSHIPS AND ASSISTANTSHIPS

Financial assistance is available to qualified students working in M.S. and Ph.D. degree programs. Financial assistance for students taking only background courses generally will not be considered until these courses have been substantially completed.

Scholarships and assistantships are two types of financial assistance for graduate students. A **scholarship** is awarded to help a student pay for costs associated with obtaining a degree, and may have certain stipulations attached. On the other hand, an **assistantship** is a job -- a student is being paid to perform work. Scholarships and assistantships often also pay for some tuition or fees, the amount of which varies according to the type of scholarship or assistantship.

Graduate students may be employed as either research or teaching assistants. Normally, students working on research projects will be employed as research assistants. Teaching assistantships are available for those students assisting faculty in classroom or laboratory activities. Requests for financial assistance should be made at the time of application to the program, and near the end of each semester after entering the program. Requests for re-appointment must be initiated by the student's major professor and should be accompanied by a work and study plan showing the proposed schedule needed to complete the degree requirements, including thesis or dissertation and final oral exam.

### Duration of Financial Assistance

A graduate student assistantship typically lasts for one semester, and that appointment expires at the end of that semester. If the employment is to extend to the next semester, then a new appointment is made. The maximum duration of graduate assistantship employment is generally limited to two years for M.S. candidates and three years beyond the M.S. degree for Ph.D. candidates. Special circumstances may warrant additional extensions, with the approval of the student's major professor and the Department Head.

An assistantship or other financial support may be terminated for failure to maintain acceptable academic standards (GPA 3.00 and a grade of C or better in all graduate courses), failure to satisfactorily perform assigned duties, or failure to otherwise make satisfactory progress toward the degree. If the agency funding the research or assistantship terminates the project and the funding, then the assistantship will also terminate (this is extremely rare).

### Number of Class Hours and Work Hours

To be appointed on an assistantship or to receive a scholarship, you are required to be enrolled in a certain number of class hours for that semester. If you are not enrolled in the proper number of hours before the first day of classes, you may lose your assistantship or scholarship.

Level of Appointment	Required Work Hours	Minimum Credit Hours	Maximum Credit Hours
One Quarter	10 hours per week	9	18
One Half	20 hours per week	6	15
Three Quarters	30 hours per week	3	6

Doctoral Students who have completed their course work and are working only on a research component must register for at least one credit hour of research (dissertation) each semester until the degree is completed.

### Obligations of Those Receiving Financial Assistance

Graduate assistantships are provided to help students complete their degree programs, to provide opportunities for learning experiences through participation in teaching and research projects, and to assist the faculty in meeting research and teaching responsibilities.

Assistantships are intended for students who will complete their classes and report/thesis/dissertation before they leave the campus and begin their next job. The policy of the department is that any degree candidate who has been employed as a graduate assistant funded from departmental or research project sources is expected to conduct research having a significant creative component and to prepare a report, thesis or dissertation.

If you accept employment as a graduate assistant, you are not to have any other employment unless you have first obtained written permission from your adviser and the Department Head. Permission is rarely given for a student employed as an assistant to also have another job. The “Outside Employment” policy of the University may also apply.

Graduate assistants are employees of the Department, and are expected to adhere to the University's faculty and staff work calendar. Time off is normally allowed only on scheduled University holidays. The weeks between semesters and Spring Break week are not holidays, and employees are expected to work during those times. A student's supervisor may approve exceptions.

A graduate assistant should also recognize that, as an employee of the Department, he or she represents the Department to the public when working on a research project. Therefore, each person should strive to present himself/herself in a professional manner – including actions, words, and appearance/proper dress.

When a graduate student is or has been employed on a graduate assistantship, he/she is being paid to complete specified work. Before such a student leaves the University, they are expected to complete the work, including writing the report, thesis, or dissertation. Therefore, the department will not sign any Immigration and Naturalization Service Optional Practical Training (OPT) forms until after you have submitted a complete final draft of your report, thesis, or dissertation.

**PROGRAM DESCRIPTIONS & GENERAL REQUIREMENTS**

Both the Masters and the Doctoral programs typically include the following two components;

- Classroom component: A student completes a specified number of advanced classes;
- Research component: A student conducts a research effort and writes a report/thesis/dissertation that describes the research.

To successfully complete any sound graduate program, a student must be able to not only successfully complete classes, but also conduct research and write well in English.

With the full approval of a student’s Program of Study Committee, a student in a Master's program will select either the "**thesis option**" (conduct a substantial research effort and writes a thesis), or the "**non-thesis option**" (a student conducts research and writes a report).

In the United States, usually only undergraduate engineering programs are accredited by ABET, Inc., (the recognized accrediting agency for university engineering and technology programs in the US); most graduate engineering programs are not accredited. Our Master of Science in Environmental Engineering (MSEnE) program is accredited by ABET. Because the MSEnE degree is accredited, students enrolled in this program may be required to take a number of additional classes.

Graduate students may be required to attend certain programs or seminars. In some instances, a graduate student will present a seminar, explaining their research activities.

**Master of Science in Civil Engineering**

The chart which follows contains program options;

MSCE			
Master of Science in Civil Engineering			
Thesis Option		Report Option	
Course Work 24 Hours*		Course Work 30 Hours*	
Thesis	6 Hours*	Report	3 Hours*
Total	30 Hours*	Total	33 Hours*

\*The number of hours listed are minimums

\*Limit of 9 hours of CVEG 400 classes

## Master of Science in Environmental Engineering

All MSEnE degree candidates, regardless of previous degree status, must demonstrate completion of all Basic Engineering Education, Environmental Engineering Breadth, and Environmental Engineering Specialization. Specialization requirements are listed below, under MSEnE Program Requirements.

### MSEnE Program Requirements

All MSEnE degree candidates, regardless of previous degree status, must demonstrate completion of the Basic Engineering Education and Environmental Engineering Breadth requirements listed below. Candidates who do not possess a degree from a program accredited by the Engineering Accreditation Commission of ABET must also satisfy the basic level ABET accreditation requirements. These include completion of no less than 48 credit hours of approved engineering topics and demonstrating, to the satisfaction of the student's graduate study committee, that they possess those abilities and characteristics required of graduates from ABET accredited engineering programs. This includes the completion of a course that concentrates on a major design project and results in the production of a design report or other design product as appropriate. The design project must build on and require engineering knowledge and skills from previous course work and must incorporate engineering standards and realistic constraints. The course selected to satisfy this requirement is subject to the approval of the student's graduate study committee.

### Basic Engineering Education Requirements

<u>General Education Topics</u>	<u>Credit Hours</u>	<u>Recommended Courses</u>
Humanities/Social Science	15	Acceptable to Undergraduate Program
English Composition I and Technical Composition II	6	ENGL 1013 and 1023
<u>Mathematics and Basic Science</u>	<u>Credit Hours</u>	<u>Recommended Courses</u>
Calculus & Differential Equations	16	MATH 2554 & 2564 & 2574 & 3404
Engineering Statistics	3	INEG 2313 <b>OR</b> STAT 3013
University Chemistry 1	4	CHEM 1123 & 1121L
University Physics I (calculus based)	4	PHYS 2054 & 2054L
General Microbiology	4	BIOL 2013 & 2011L
Physical Chemistry <b>OR</b> Organic Chemistry	4	CHEM 3504 <b>OR</b> CHEM 3603 & 3601L
Geology for Engineers <b>OR</b> Soil Science	2	GEOL 3002 <b>OR</b> CSES/ENSE 2203
<u>Basic Engineering Topics</u>	<u>Credit Hours</u>	<u>Recommended Courses</u>
Statics	3	MEEG 2003
Fluid Mechanics <b>OR</b> Hydraulics Mechanics of Fluids	3	CHEG 2133 <b>OR</b> CVEG 3213 <b>OR</b> MEEG 3503
Public Works Economics <b>OR</b> Engineering Economic Analysis	2	CVEG 3022 or INEG 3413
Computer Applications	3	

Environmental Engineering Breadth Requirements (18 hours required)

<u>Required Topics</u>	<u>Credit Hours</u>	<u>Recommended Courses</u>
Fundamentals of Environmental Eng.	3	CVEG 3243
Reactor Design	3	CHEG 3333 <b>OR</b> BENG 3733
Thermodynamics	3	MEEG 2403

<u>Elective Topics (6 hours required)</u>	<u>Credit Hours</u>	<u>Recommended Courses</u>
Heat Transport	3	CHEG 3143
Chemical Process Safety	3	CHEG 4813
Hydrology	3	CVEG 3223
Environmental Eng. Design	3	CVEG 4243
Occupational Safety and Health Standards	3	INEG 4223
Principles of Epidemiology	3	HLSC 4613
Environmental Health	3	HLSC 6553
Non-Equil. Mass Transfer	3	CHEG 3153
Thermal System Analysis and Design	3	MEEG 4483

Note: The 4000 level and above courses listed above carry graduate credit and may be used in partial fulfillment of the graduate degree requirement provided they have not previously been used for credit toward a BS degree and they are approved by the student's graduate study committee.

Environmental Engineering Specialization (MSEnE Graduate Program)

The following chart lists options for the MSEnE degree.

MSEnE MASTER OF SCIENCE IN ENVIRONMENTAL ENGINEERING			
THESIS OPTION		REPORT OPTION	
Course work 24 hours*		Course work 30 hours*	
<b>Thesis</b>	<b>6 hours*</b>	Report	3 hours*
<b>Total</b>	<b>30 hours*</b>	Total	33 hours*

\*The number of hours listed are minimum's

\*Limit of 9 hours of CVEG 4000 classes

Specialty Areas and Approved Courses:

Students are expected to select the required hours of graduate courses from one of the two following specialty areas and listing of approved courses. Other courses will be considered on petition to the student's graduate study committee and the Coordinator of Environmental Engineering Studies.

Pollution Prevention and Control Specialty Area

CHEG 4263, Environmental Experimental Methodology  
CHEG 4813, Chemical Process Safety  
CHEG 5513, Biochemical Engineering Fundamentals  
CVEG 4243, Environmental Engineering Design  
CVEG 4263 Environmental Regulations and Permits  
CVEG 5234, Water and Wastewater Analysis  
CVEG 5243 Groundwater Hydrology  
CVEG 5253, Microbiology for Environmental Engineers  
CVEG 5273, Advanced Pollution Control  
CVEG 5283, Solid Waste Management  
CVEG 5753 or CHEG 5753, Air Pollution  
MEEG 4453, Industrial Waste and Energy Management  
MEEG 4473, Indoor Environmental Control  
MEEG 4483, Thermal Systems Analysis and Design  
MEEG 4603, Basic Nuclear Engineering  
MEEG 4623, Radiation Protection and Shielding  
MEEG 4813, Air Pollution Abatement  
MEEG 4843, Environmentally Conscious Design and Manufacturing

Natural and Water Resources Specialty Area

BENG 4113, Risk Analysis for Biological Systems  
BENG 4903, Water Resource Engineering  
BENG 4913, Bioenvironmental Engineering  
CVEG 4253, Small Community Wastewater Systems  
CVEG 4263 Environmental Regulations and Permits  
CVEG 5234, Water and Wastewater Analysis  
CVEG 5243, Groundwater Hydrology  
CVEG 5253, Microbiology for Environmental Engineers  
CVEG 5263, Stream Pollution Analysis  
CVEG 5283, Solid Waste Management  
CVEG 5293, Water Treatment & Distribution System Design  
CVEG 5734, Advanced Wastewater Process Design and Analysis  
GEOL 4033, Hydrogeology  
AGRN 5224, Soil Physics

Additional Requirement: Each MSeNE candidate must submit a manuscript on their area of research to an appropriate peer-reviewed journal as determined by their Graduate Program of Study Committee. The manuscript should meet the guidelines for authors of the journal.

## Master of Science in Engineering

The Master of Science in Engineering (MSE) degree is awarded only to students who pursue the degree through distance education. It is designed for students who do not wish to specialize in a particular field or for students who do not have an undergraduate degree in Civil Engineering.

A total of 30 semester credit hours are required to complete degree requirements for the MSE. A student has two basic options to meet the 30 hour requirement: a program option or a course work option.

- Program option: a minimum of 24 credit hours (eight 3-hour courses) of approved graduate coursework as specified below AND a maximum of 6 credit hours (two 3-hour courses) of GNEG 590V Special Topics, for a minimum of 30 hours. Project requirements will require both a Project Proposal Report and Final Project Report.
- Coursework option: a minimum of 30 semester credit hours (ten 3-hour courses) of approved graduate coursework as specified below.

### Required course work for either option includes:

- One 3-hour course from each of the following four areas for a total of 12 hours: Mathematics, Computer Applications, Technical Communications, and Engineering Management, and
- Three 3-hour engineering courses that form a cohesive topic or area of emphasis with the approval of the advisory committee, and
- Nine additional graduate-level hours from any area approved by the advisory committee.
- A minimum of 50% of the course work must be engineering, non-operations management (OMGT), classes.
- A maximum of four 4000-level graduate level courses may be taken; the remainder must be 5000-level or higher.

A thesis is not required; however, towards the end of the program students will be required to complete a comprehensive oral exam. Students must also maintain a  $\geq 3.0$  GPA, with no more than two "C" grades; no credit will be received for courses with "D" or "F" grades, though they will be calculated into the GPA. A student has six years to complete all degree requirements.

## Doctor of Philosophy (Ph.D.)

Doctor of Philosophy programs consist of in-depth study through advanced courses in civil engineering and support disciplines, plus an intensive research investigation leading to the preparation of a dissertation. Preparation of a paper suitable for presentation at technical conferences and for publication in technical journals also is expected.

Candidates for the Ph.D. degree must either satisfy a language requirement by demonstrating a reading knowledge of a foreign language that has been recommended by his or her Doctoral Advisory Committee, or complete 6 semester credit hours of course work in a field consistent with the student's program of study (outside the Department of Civil Engineering) and career goals.

The following chart lists some program details.

Ph.D. Doctor of Philosophy in Engineering
72 hours of credit beyond the B.S. Degree, including dissertation research
48 hours of forma coursework beyond the BS degree
42 hours of credit beyond the M.S. degree
18 hours of dissertation research
<ul style="list-style-type: none"><li>• The number of hours listed are minimum</li><li>• Limit of 9 hours of CVEG 4000 classes</li></ul>

## PLANNING A GRADUATE PROGRAM

Application for admission to a graduate program implies a commitment on the part of the student to acquire further education in a chosen field of practice. The student is responsible to a great extent for initiating actions required for fulfilling the requirements for the degree. This includes taking the initiative to see that all deadlines for activities and submission of forms are met. The student is responsible for keeping his or her major professor informed of the progress on assignments, for initiating and conducting a research project with the assistance and cooperation of the major professor, and for scheduling committee meetings and candidacy exams.

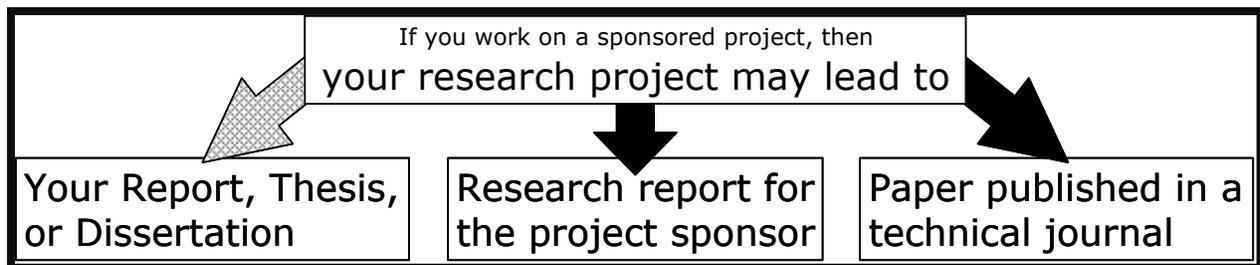
The requirements for completing many, if not most graduate engineering programs, call for students to successfully:

- complete a specified number of class hours;
- Conduct research and prepare a research paper.

### Planning a Research Component

Writing a research paper is a significant part of an M.S. or Ph.D. degree. For an M.S. program, the paper may be a report or a thesis. For a Ph.D., it is a dissertation. A report, thesis, or dissertation is based on research a student performs under the supervision of a professor. A report is less rigorous than a thesis. The M.S. thesis or Ph.D. dissertation represents the effort at written research that serves as part of the degree requirements.

The student is responsible, with the assistance of the major professor and Program of Study Committee, for planning and designing a research project serving as a basis for his or her report, thesis, or dissertation. It is not uncommon for this report/thesis/dissertation paper to be based on work a student performs while employed as a graduate assistant by the University. Often, the same work that a student does for their research is the not only the basis for the report/thesis/dissertation, but also becomes a report for the agency that sponsored (i.e., paid for) the research, and is submitted to a technical journal for publication. This means that your paper must be written to conform to certain guidelines spelled out by others, so it can be converted into a research report or journal article.



It is not always possible for a student to write a thesis or dissertation based on her/his University employment. If a student is not employed to do the kind of work that one can write an acceptable report, thesis, or dissertation about, then the student may propose their own topic and write a report, thesis, or dissertation.

Preparation of the thesis or dissertation is the responsibility of the student and its completion includes a professional obligation to the major professor and to the department. Completion of the thesis or dissertation within a reasonable time period requires careful planning and timely execution of the underlying research project. Thus, the student has the obligation to begin research work as soon as possible after beginning the program of study and not delaying research activities until all course work is completed. Lack of progress toward completion of the research work and preparation of a thesis or dissertation indicates problems with the conduct of the research, the analysis of data, or the writing of the report. In either case, it is the responsibility of the student to contact his or her major professor or Program of Study Committee for advice on how to proceed. If differences occur between the student and the major professor or Program of Study Committee that seemingly cannot be resolved, the Department Head should be contacted for resolution of differences or referrals to other persons or offices.

While initiation of actions is the student's responsibility, the major professor and Program of Study Committee are responsible for assessing the quality and completeness of the degree program and may provide suggestions or requirements above the minimum stated in the Graduate Catalog or this Graduate Student Guide.

### Selection of a Major Professor

A member of the graduate faculty within the department will serve as a major professor for directing a student's program of study. This association is based largely on the common interests of the student and the faculty member and typically is arranged at the time of admission to the program. The student's personal preference for a specific major professor will be honored to the maximum extent possible, although some adjustment may be required to accommodate faculty loads and financial resources. The major professor is the student's academic adviser as well as supervisor of a research program that includes preparation of a thesis or dissertation. Generally, the principal investigator of research projects on which the student is supported will be the student's major professor.

The major professor will assist the student in nominating a Program of Study Committee, will periodically review the progress of the student's research program and will assist the student with preparation of the thesis or dissertation before it is submitted to the Program of Study Committee.

### Selection of a Program of Study Committee

A graduate student working toward a degree should select a Program of Study Committee prior to the second semester in residence. The student's major professor will serve as chairperson of this committee. Committee members are selected from department or university faculty whose educational and research interests are best suited to guide the student and evaluate the progress of his or her graduate study. The student should contact prospective committee members prior to appointment by the Department Head and the Dean of the Graduate School. M.S. committee members may be selected from graduate faculty members within the student's major department and the committee must consist of at least three members. Selection of one member from outside the Civil Engineering Department is strongly encouraged. Ph.D. committees must consist of a minimum of three members selected from the graduate faculty, one of which must be from a department other than the student's major department. The Department Head is an ex-officio member of all Program of Study Committees.

The Program of Study Committee should meet periodically to review the student's progress and to provide input and direction to the program. As a minimum, formal meetings should be held to approve the program of study, at the preliminary exam for Ph.D. candidates, and at the final oral exam or thesis or dissertation defense.

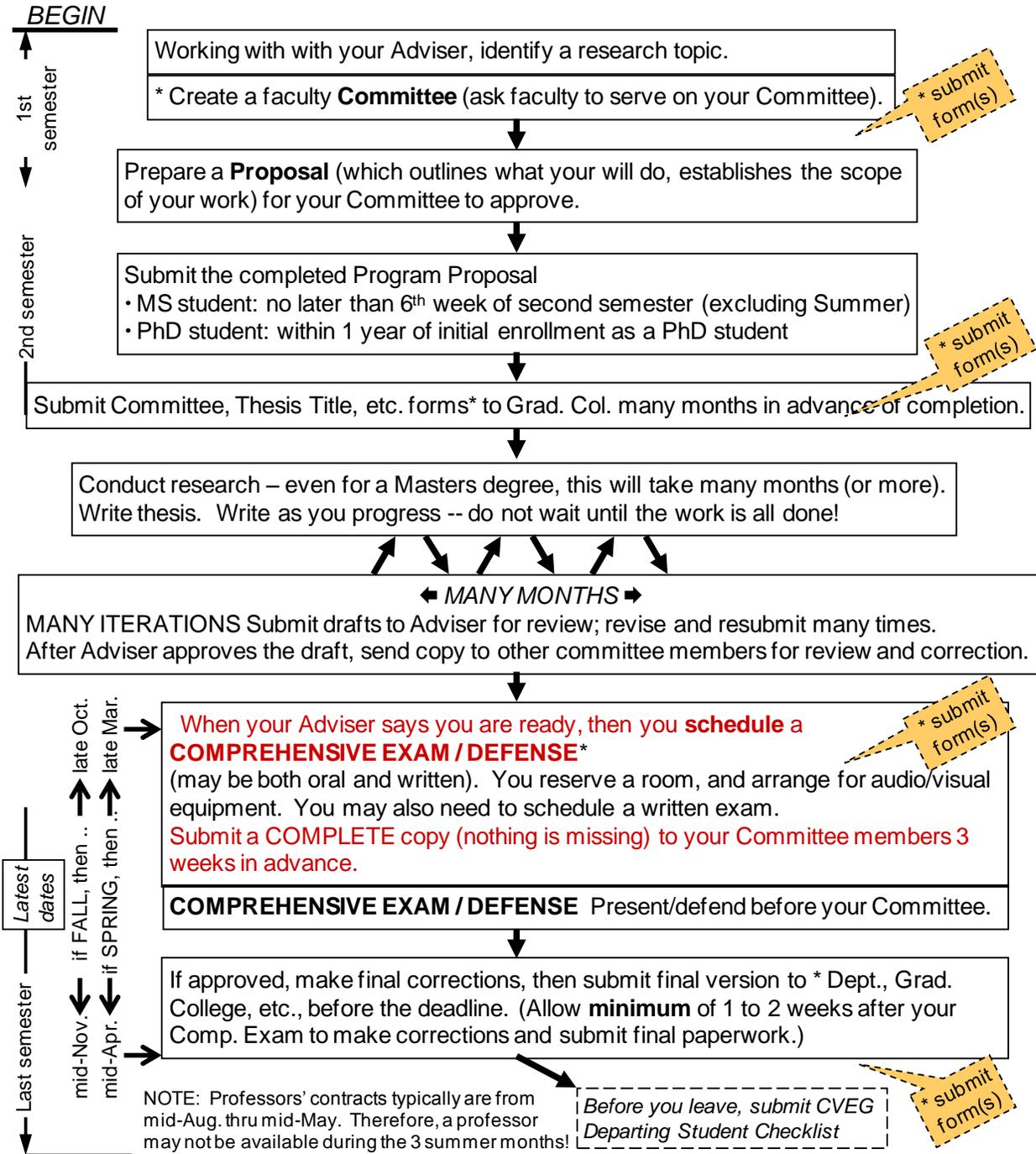
## GRADUATE STUDENTS: FIGURE HOW MUCH TIME IT WILL TAKE TO COMPLETE YOUR PROGRAM.

### OVERVIEW OF STEPS AND TIMELINE FOR YOUR RESEARCH

This diagram outlines some of the steps involved in MS or PhD research. This timeline is more reflective of a Masters degree; some of the steps for a Doctoral degree are different.

This outline does not include all of the details -- refer to documents from the CVEG Department and the Grad College.

*Even a simple MS report will require a **minimum of a semester**; many students take longer. A thesis or dissertation will require **more/much more time!***



## Program Proposal

All graduate students must prepare and submit a program proposal, as described in the following. To help you prepare the proposal, ask your adviser where to find the Civil Engineering departmental guide for preparing a proposal.

## Master's (M.S.) Students

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- Each student must attend an orientation session, workshop, or personal appointment with the Engineering Research Librarian regarding library services and procedures prior to submitting the Master's Program Proposal. The student must submit written documentation certifying participation in any such activity.
- A Master's Program Proposal must be completed by the sixth week of the second semester of the student's graduate program. The Master's Program Proposal must contain, at a minimum, the following items:
  - A list of the Graduate Program Committee members.
  - A discussion of the research topic for the Master's Thesis or Report; the content and extent/scope of this discussion is determined in consultation with the student's thesis/report adviser.
  - A list of support items necessary for completing the proposed research, i.e. laboratory space, specific equipment requirements, computing requirements, projected expendable supplies, projected travel requirements, etc.
  - A list of the coursework to be completed for the degree sought.
  - A proposed schedule/timeline for completing the research, including a date for delivering a complete draft of the Master's thesis/report. The proposed schedule should identify specific milestones to be accomplished during the research and thesis/report preparation effort.
- All required forms related to the Master's Program must be submitted to the graduate school within three working days after successfully completing the Master's Program Proposal. It is the student's responsibility to:
  - correctly complete all forms and submit them to the appropriate person(s); and
  - submit copies of these forms to the Department of Civil Engineering, to be placed in the student's academic file.

## Ph.D Students

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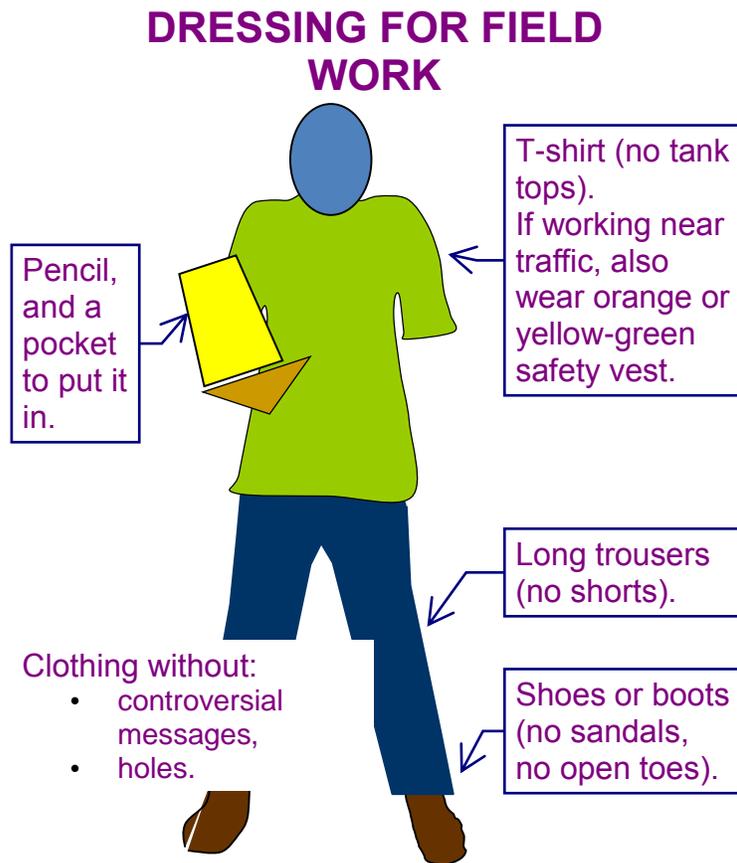
- Each student must attend an orientation session, workshop, or personal appointment with the Engineering Research Librarian regarding library services and procedures prior to submitting the Doctoral Program Proposal. The student must submit written documentation certifying participation in any such activity.
- A Doctoral Program Proposal must be completed within 1 year of the student's initial enrollment as a Ph.D. student. The Doctoral Program Proposal must include the following items, as well as others specified by the Program of Study Committee.
  - A list of the Doctoral Program Committee members.
  - A discussion of the research topic for the Doctoral Dissertation; the content and extent/scope of this discussion is determined in consultation with the student's dissertation adviser. It is expected, however that the discussion will demonstrate a high degree of understanding of the scope and objectives of the proposed research, and will contain a significant review of pertinent literature related to the topic.
  - A list of support items necessary for completing the proposed research, i.e. laboratory space, specific equipment requirements, computing requirements not commonly available, projected expendable supplies, projected travel requirements, etc.
  - A list of the coursework to be presented for the degree, including both previously completed and proposed courses.
  - A proposed schedule/timeline for completing the research, including a date for delivering a complete draft of the dissertation. The proposed schedule should identify specific milestones to be accomplished during the research and dissertation preparation effort.
- All required forms related to the Doctoral Program must be submitted to the Graduate School within three working days after successfully completing the Doctoral Program Proposal. It is the student's responsibility to:
  - correctly complete all forms and submit them to the appropriate person(s);
  - submit copies of these forms to the Department of Civil Engineering, to be placed in the student's academic file.

**Conduct of Research**

Tasks required for the completion of the research portion of the graduate program should be conducted in a professional manner. This includes timeliness, thoroughness, and with utmost integrity. Work spaces should be kept orderly. All applicable safety rules and policies must be followed stringently; safety equipment and supplies must be kept well-stocked and used as appropriate. Project deliverables – items such as laboratory/field data, reports, photo/video recordings, etc. – should be submitted as required, in a timely fashion. In addition, backup copies of deliverables should be kept up-to-date to reduce the risk of ‘losing’ valuable project data.

Graduate students may be required to conduct research activities in the laboratory and/or in the field. At all times, graduate students should remember that they represent the University of Arkansas and the Department of Civil Engineering while conducting University-related business. As such, each person should strive to present himself/herself in a professional manner – in speech, actions, and appearance. The suggested dress for working ‘in the field’ is shown in the diagram which follows. Depending on the type of work being performed, additional clothing items and/or accessories may be required, i.e. a nuclear dosimetry badge when using a nuclear gauge.

Again, each person should recognize that, when working on a university-sponsored project, he/she represents the University and the Department.



- You may also wish to bring your own water to drink, insect repellent, sunscreen, raincoat, umbrella, and cap.
- From October through April in Arkansas, you may need a warm coat.
- In some parts of the US, you need a warm coat all year; at higher elevations, it can snow in

### Master's and Doctoral Forms

- ✓ Master's Thesis Title
- ✓ Master's Program Advisory Committee
- ✓ Master's Thesis Committee
- ✓ Master's Record of Progress
- ✓ Master of Science in Transportation Engineering Degree Check Form
- ✓ Master of Science in Environmental Engineering Degree Check Form
- ✓ Doctoral Dissertation Title
- ✓ Doctoral Program Advisory Committee
- ✓ Doctoral Dissertation Committee
- ✓ Doctoral Record of Progress
- ✓ Intellectual Property Disclosure
- ✓ Library Transmittal Form
- ✓ Annual Graduate Student Review
- ✓ Graduate Student Checklist
- ✓ CVEG Guide for Preparing Theses and Dissertations

### Comprehensive Exam, Defense, Candidacy Exam, and Final Examination

In addition to the tests a student takes in each class, graduate programs typically include other examinations. The number and the type of examinations addressing graduate class work and research differ according to the type of program. As mentioned elsewhere, both Master's and Doctoral students will prepare a Proposal before beginning their research.

- Master's Program students will have a combined final Comprehensive Exam and Defense. The Comprehensive Exam may include written and/or oral questions from any or all of the topics in the student's classes. A Defense consists of a presentation of the master's Report or Thesis, followed by answering questions about the Report/Thesis. The graduate student will be judged by how well he/she performs on the written and oral tests, the quality of his/her master's Report or Thesis, the presentation, and how well he/she responds to questions from the Committee.
- Doctoral Program students will have a Candidacy Exam before being formally accepted as a doctoral degree candidate. The Candidacy Exam normally is given after at least two semesters of graduate study in this department. This exam must include a written portion, and may also include an oral portion. When the candidate's research is complete and the dissertation is prepared, the candidate will have a Final Examination. During the Final Examination, the candidate will make a presentation on the dissertation and answer questions from the Committee. The questions will primarily concern the dissertation but may include other aspects of the student's graduate work.

Only when a graduate student has completed an acceptable Report, Thesis, or Dissertation is he or she ready to schedule the Comprehensive Examination and Defense or Final Examination. A graduate student will take the following steps:

- Contact committee members at least 3 weeks in advance to find a suitable date and time for the presentation and oral questions.
  - At that time, distribute revised copies of the Report, Thesis, or Dissertation to the committee members.
  - Masters students also ask committee members if they wish to schedule a written component for the comprehensive exam, to take in addition to and separately from oral questions in the presentation.
- Reserve a room for the exam (usually the CVEG Conference Room). Reserve the room for 1 hour before your exam is to begin, and for 2 hours after the starting time.
- Check to make sure all forms have been filled out. Masters students bring a partially-completed “Record of Progress” form to the presentation of their Report or Thesis.
- Prepare a presentation of your Report, Thesis, or Dissertation -- many students do this on PowerPoint®. Graduate students’ presentations of their research are often about 20 minutes long. Familiarize yourself with the audio-visual equipment in the room in which you are holding your defense. Practice your presentation in advance, and check to see how much time you take.

### Publishing the Research

One of the many tasks expected of the faculty is publication of research work that they have supervised. If a faculty member has supervised or directed work that you have performed, then they may wish to submit some or all of that to technical journals, for consideration for publishing. If you wish to take the initiative and be involved in this yourself, notify the faculty member; otherwise, the faculty member may assume the responsibility for this.

**Student Name:** \_\_\_\_\_  
**University of Arkansas**  
**Department of Civil Engineering**  
**Graduate Student Checklist**

**APPENDIX A**

This form must be completed and submitted to the Department Head, Department of Civil Engineering, prior to the granting of a graduate degree.

**Administrative**

<b>Item</b>	<b>Date</b>	<b>Signature</b>
_____ Forwarding Address to CVEG Department	_____	_____ (Sandy Thomas, CVEG Dept.)
_____ Keys:		
_____ Bell Engr. Center	_____	_____ Attach receipt from UA Key Office
_____ Engr. Res. Center	_____	_____ (Student's Major Advisor)
_____ Other	_____	_____ (Student's Major Advisor)
_____ Books:		
_____ Faculty	_____	_____ (Student's Major Advisor)
_____ Research Data Files	_____	_____ (Student's Major Advisor)

**Laboratory**

<b>Item</b>	<b>Date</b>	<b>Signature</b>
_____ Tools/Supplies returned (Bell Engr / ERC)	_____	_____ (Mark Kuss, CVEG Dept.)
_____ Equipment/Area cleaned (Bell Engr / ERC)	_____	_____ (Mark Kuss, CVEG Dept.)
_____ Material Disposal (Bell Engr / ERC)	_____	_____ (Mark Kuss CVEG. Dept.)

**FORM CERTIFICATION** \_\_\_\_\_  
**(Dr. Kevin D. Hall, CVEG Dept. Head)**

