UNIVERSITY OF ARKANSAS
COLLEGE OF ENGINEERING

Civil Engineering Graduate Student

HANDBOOK

2017-2018

University of Arkansas

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WHY THIS HANDBOOK?

This handbook supplements the Graduate School Catalog and other materials provided by the Graduate School and the College of Engineering. The purpose of the Civil Engineering (CVEG) Graduate Student Handbook is 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.

As a core of its mission, the University of Arkansas provides 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 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/academicintegrity. Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor.

PROGRAM OVERVIEW

The CVEG Department offers three Masters of Science graduate programs:

- Master of Science in Civil Engineering (MSCE); this is a thesis-based degree that requires completion of 24 credit-hours of coursework and 6 credit-hours of thesis research
- Master of Science in Environmental Engineering (MSEnE); this is a thesis-based degree that requires completion of 24 credit-hours of coursework and 6 credit-hours of thesis research
- Master of Science in Civil Engineering (MSCE Coursework Only); this is a coursework-only degree that requires completion of 30 credit-hours of coursework

In addition, a coursework-only Master of Science in Engineering (MSE) degree is administered through the College of Engineering. This degree is offered only to students pursuing the degree through distance education and is not detailed further in this document.

The CVEG MS programs are designed to:

- Broaden a student's knowledge of the principles and practices of Civil and/or Environmental 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

The CVEG Department also offers a Doctoral (Ph.D.) degree. Ph.D. students are expected to be capable of independent scholarly study and to possess the ability to further engineering practice through research and other creative pursuits.

The PhD program is designed to:

- Explore new frontiers in Civil Engineering;
- Organize and conduct an intensive research study in a specific problem area ;
- Compile and organize data and its analysis in a form suitable for publication in peer-reviewed literature

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

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

MESSAGE FROM THE DEPARTMENT HEAD

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, and are committed to putting you in a position to succeed.

We ask that you read this Handbook carefully. It will serve as your guide to navigate the various policies and procedures of the Department, the College, and the University. It also will provide you with valuable information for planning, executing, and completing your graduate program. In many cases, this Handbook will reference College of Engineering and/or Graduate School policies. I urge you to locate and read all applicable policies, so that your primary focus will be properly placed on your studies and research activities, rather than with administrative logistics.

Ultimately, your experience in Graduate School will be largely determined by your own drive and passion. We are excited and honored to help you discover and nurture that passion. The global society needs engineers to address and solve significant issues facing people each day. Your graduate degree will enable you to step into a leadership role as that problem solver.

We look forward to working with you throughout your degree program. *We are here to help!* If any of the faculty or staff can be of assistance, please do not hesitate to ask.

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MEET THE FACULTY

Environmental


Findlay Edwards


Julian Fairey

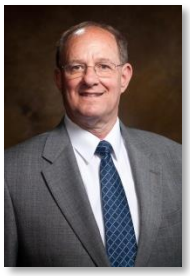

Rodney Williams

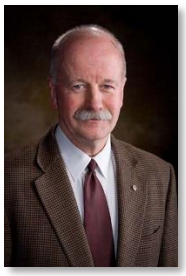

Wen Zhang

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


Sarah Hernandez


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, applicants must meet the following specific requirements to be accepted for graduate study in the Department of Civil Engineering, which include:

- Grades in University classes, including an undergraduate degree in Civil Engineering or closely related discipline with a cumulative GPA above 3.0 (on a 4.0 scale);
- GRE (Graduate Record Examination) scores of 302 (verbal + quantitative) and 3.5 (analytical writing);
- Foreign applicants without a degree from a U.S. institution or a native English-speaking country must have a TOEFL (Test of English as a Foreign Language) score of 79 or equivalent;
- Statement of purpose including the applicants intended area of specialization.

Undergraduate Degree Requirements

Applicants possessing an ABET-accredited undergraduate engineering degree, and applicants with an undergraduate engineering degree from a foreign university are eligible for admission into the graduate program.

Applicants who do not have an undergraduate engineering degree from an ABET-accredited institution are eligible for admission into the graduate program, provided a CVEG faculty member, who is willing and able to be their major adviser, determines their academic background is suitable for study at the M.S. or Ph.D. level.

Transfer of Credit from Other Universities

A M.S. or a Ph.D. student may apply to receive transfer credit for one or more classes (up to 6 credit hours) from another recognized graduate school in the United States, provided the class grade was B or better, all U of A 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 M.S. or a Ph.D. program. 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 on a competitive basis to qualified students working in M.S. and Ph.D. degree programs.

A **scholarship** is awarded to help a student pay for costs associated with obtaining a degree, and may have certain stipulations attached. In an **assistantship**, a student is paid to perform specific work and typically includes a monthly stipend and payment of tuition. An assistantship can take the form of a teaching assistant (TA) or research (RA) assistant position. Typically, students working on research projects will be employed as a RA. Alternatively, TA's are available to those students assisting faculty in classroom or laboratory activities.

Requests for financial assistance should be made at the time of application to 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 must be renewed each semester. 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. However, this is extremely rare.

Number of Credit Hours, Research Hours, and Coursework Requirements

To be appointed to an assistantship, a student is required to complete a certain number of credit hours for that semester – 6 in the fall, 6 in the spring, and 3 in the summer. A maximum of 9 credit hours is permitted for the fall and spring semesters and 6 for the summer.

Most graduate students have a 50% appointment, which requires 20 hours of research per week. This appointment pays tuition and monthly stipend, but not fees. Alternatively, students may also have a 25% appointment, which requires 10 hours of research per week but does not cover tuition or fees.

Ph.D. students who have completed their course work and are not appointed must register for at least one credit hour of research (dissertation) each semester until the degree is completed to maintain student status.

MSCE Coursework Only students must complete 30 hours of coursework at the 4000- and 5000-level. A maximum of 6 credit hours may be at the 4000-level, provided they were not presented for another degree (e.g., BS degree).

MSCE students (thesis option) must complete 24 hours of course work at the 4000- and 5000-level. A maximum of 6 credit hours may be at the 4000-level, provided they were not presented for another degree (e.g., BS degree).

Doctoral students must complete 36 hours of course work at the 5000-level; however, up to 6 credit hours may be at the 4000-level, provided they were not presented for another degree (e.g., BS degree). As such, a student obtaining a MS from the CVEG program needs to complete an additional 12 hours of coursework to satisfy this requirement for a PhD.

Obligations of Those Receiving Financial Assistance

Submission of Thesis or Dissertation

The policy of the department is that any degree candidate who has been employed as a graduate assistant is expected to conduct research having a significant creative component and to prepare and defend a thesis or dissertation. For international students, the department will not sign any U.S.

Citizenship and Immigration Services F-1 Optional Practical Training (OPT) forms until the graduate student has submitted a complete thesis or dissertation to the Graduate School.

Outside Employment
For students employed as a RA or TA, other employment is not permitted unless written permission is obtained from the major adviser and Department Head. However, permission is rarely given for a student employed as a RA or TA. Other University policies regarding employment may also apply.

Work Schedule
RAs and TAs are employees of the CVEG 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 major advisor may approve exceptions.

Employee Conduct
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.

PROGRAM DESCRIPTIONS

General Requirements

Both the MSCE and the PhD programs include classroom and research components. For the classroom component, students must complete a specified number of advanced classes. For the research component, students must conduct research and write a thesis/dissertation that describes the research and its contribution to the field of study.

Master of Science in Civil Engineering (MSCE)

The following chart lists options for the MSCE (thesis track) and MSCE Coursework Only degrees.

Component	MSCE	MSCE Coursework Only
Coursework	24 hours	30 hours
Master's Thesis	6 hours	0 hours
Total	30 hours	30 hours

*The number of hours listed are minimums
*Limit of 6 hours of CVEG 4000 classes

For the MSCE (thesis track) degree, in lieu of a traditional thesis, submission of at least one manuscript for publication in a peer-reviewed journal may be substituted, as determined in consultation with the students major advisor and thesis committee. The student must be first author on at least one manuscript submittal.

For the MSCE (coursework only), a graduate portfolio is required. The Graduate Portfolio provides evidence of attainment of the Student Learning Outcomes (SLO) for the graduate programs in the

Department of Civil Engineering. It is the responsibility of the graduate candidate to select and archive his/her graded work which demonstrates SLO attainment. The candidate's graduate academic adviser will coordinate a review of the Portfolio and the preparation of an Assessment of Abilities (AA) form prior to the granting of a graduate degree.

The student should archive graded work – including exams, homework assignments, projects, papers, etc. – which demonstrates achievement of the graduate Student Learning Outcomes:

1. **Apply** knowledge of mathematics, science, and engineering to **solve** advanced-level problems in civil engineering.
2. **Locate** and **evaluate** pertinent published literature relevant to a given topic, and **apply** the information gained to a design, analysis, or research effort.
3. **Organize** and **deliver** effective communications.
4. **Design** a system, component, or process to meet desired needs.
5. **Design** and **conduct** experiments, and **analyze** and **evaluate** the resulting data.

Students are encouraged to maintain a binder (or other suitable format) subdivided by SLO, in which graded work is archived. It is preferable to include a minimum of 2 work items per SLO in the portfolio, if possible, drawn from a cross-section of the student's educational activities and courses. Portfolios may be maintained and submitted electronically, using scanned copies of graded work; however, such electronic portfolios should be well organized, and provide a reviewer clear indication of which work pertains to specific learning outcomes.

In all cases, students are strongly encouraged to work closely with the academic adviser to ensure the Portfolio reflects the students' abilities and accomplishments *throughout their graduate programs*. **It is advisable to not postpone preparing the Portfolio, but instead to consider it as a work in progress throughout the student's graduate program**.

Doctor of Philosophy (Ph.D.)

Doctor of Philosophy programs consist of in-depth study through advanced courses in civil engineering and supported disciplines, plus an intensive research investigation leading to the preparation of a dissertation. In lieu of a traditional dissertation, submission of at least three manuscripts for publication in peer-reviewed journals may be substituted, as determined in consultation with the students major advisor and dissertation committee. The student must be first author on at least three journal submissions and at least one article must be accepted for publication prior to graduation.

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/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 for the PhD degree. Coursework and research credit requirements depend on the student's highest degree at the time of application to the Ph.D. program.

Doctor of Philosophy in Engineering (Ph.D.)	
Previous highest degree	**Requirements**
B.S.	72 credit hours, including Doctoral Dissertation and coursework credits
	A minimum of 36 credit hours of coursework
	The difference in credit hours in Doctoral Dissertation
M.S.	42 credit hours, including Doctoral Dissertation and coursework credits
	A minimum of 12 credit hours of coursework
	The difference in credit hours in Doctoral Dissertation
*Limit of 6 hours of CVEG 4000 level classes total can be applied to a Ph.D.	

PLANNING A GRADUATE PROGRAM

The student is responsible for initiating actions required for fulfilling the requirements for the degree. This includes ensuring all deadlines for activities are met and submission of the properly completed forms. 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.

Planning a Research Component

A thesis or dissertation is based on research a student performs under the supervision of an advising professor. The student is responsible, with the assistance of the advisor and Program of Study Committee, for planning and designing a research project serving as a basis for his or her thesis or dissertation. It is most common for the thesis/dissertation to be based on work a student performs while employed as a RA. Often, the same work that a student does for his/her research is the basis for the thesis/dissertation as well as reports to funding agencies that sponsored the research and technical journals for publication.

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. It is the responsibility of the student to coordinate with his or her major professor or Program of Study Committee for advice on how to complete the thesis or dissertation. 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.

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 to satisfy the minimums stated in the Graduate Catalog or this Graduate Student Guide.

Selection of a Major Professor

A member of the graduate faculty within the CVEG 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 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 after joining the program. 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 Department Head is an ex-officio member of all Program of Study Committees. The following describes the requirements for committee membership:

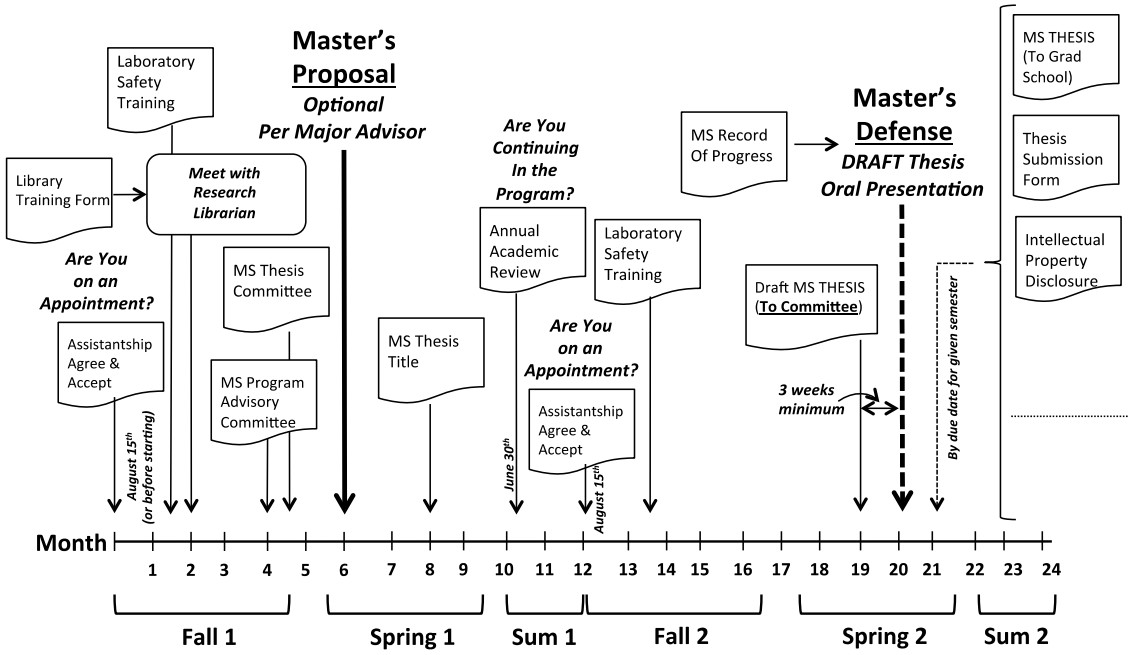
- M.S. committee must consist of a minimum of three members selected from the graduate faculty, at least two of which must be from the CVEG department
- Ph.D. committees must consist of a minimum of four members selected from the graduate faculty, one of which must be from outside the CVEG department

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.

Suggested Timeline

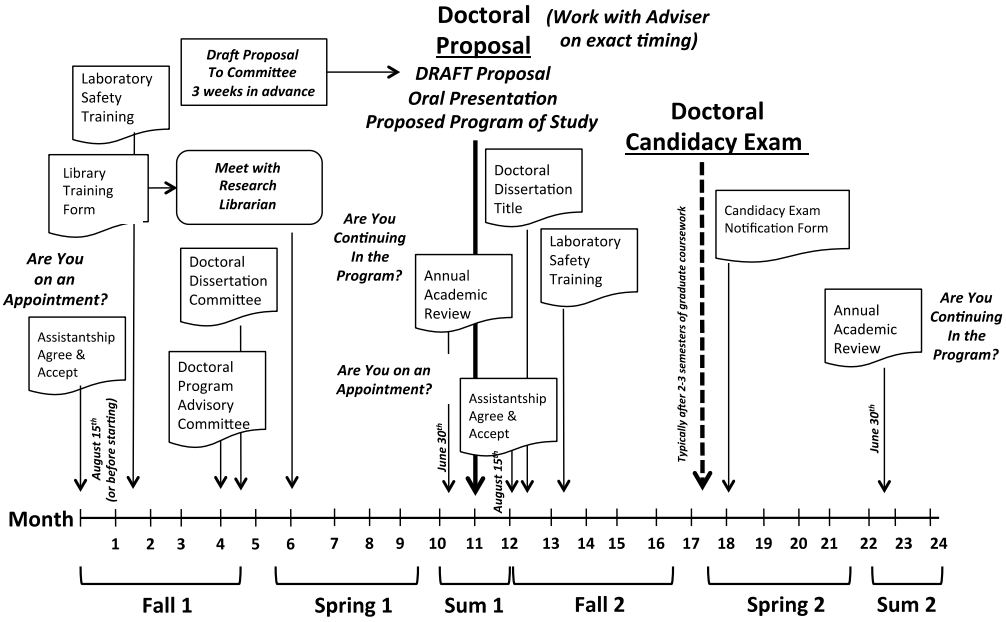
The chart which follows shows a typical MSCE timeline and the various tasks required.

Master's Program Timeline



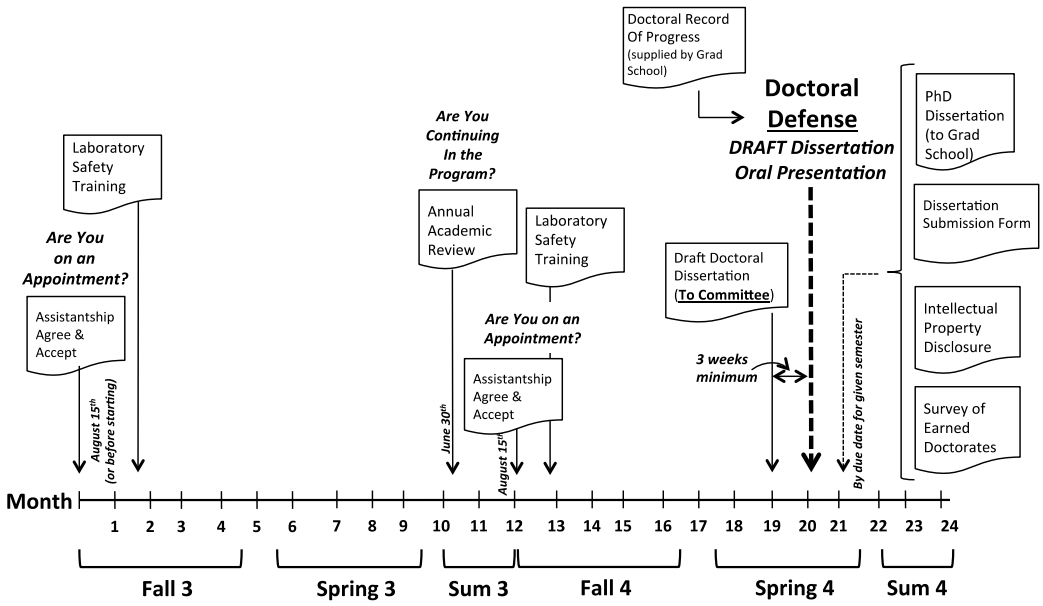
The chart which follows shows a typical PhD timeline for Years 1 and 2 and the various tasks required.

Doctoral Program Timeline *(Years 1&2)*



The chart which follows shows a typical PhD timeline for Years 3 and 4 and the various tasks required.

Doctoral Program Timeline *(Years 3&4)*



PROGRAM PROPOSAL

All Ph.D. students must prepare and submit a Program Proposal. M.S. students (thesis track only) are encouraged to submit a Program Proposal although it is not required. A Ph.D. Program Proposal must be completed a minimum of 1 year prior to the student's Ph.D. defense.

For both M.S. and Ph.D. students, 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 Program Proposal. The student must submit written documentation certifying participation in such activity. The following lists show the major elements that should be included in the Program Proposal.

Program Proposal Content for M.S. Students (thesis track only)

- A list of the Graduate Program Committee members.
- A literature review of the research area
- A discussion of the research topic for the Master's Thesis; the content and extent/scope of this discussion is determined in consultation with the student's thesis 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. The proposed schedule should identify specific milestones to be accomplished during the research and thesis preparation effort.

- All required forms related to the M.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.

Program Proposal Content for Ph.D. Students

- A list of the Doctoral Program Committee members.
- A literature review of the research area
- 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. 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. The items are suggested dress for working 'in the field':

- T-shirt (no tank tops); if working near traffic, also wear orange or yellow-green safety vest
- Long trousers (no shorts)
- Shoes or boots (no sandals, no open toes)
- Clothing without controversial messages or holes
- You may also wish to bring your own water to drink, insect repellent, sunscreen, raincoat, umbrella, and cap

PROGRAM EXAMINATIONS

M.S. students (coursework only) will have a Final Examination administered by the program of study committee. Typically, each committee member submits one or two problems to the major advisor along with stipulations regarding resources (i.e., open book/notes, internet access, etc.) and time allotted (typically 2-4 hours). The major advisor compiles the exam and sends it to the student with the stipulations of each question. The student returns the exam to the major advisor and, in turn, to each committee member for grading. Each committee member assigns a grade and the major advisor assigns an overall grade (typically pass/fail).

M.S. students (thesis track) will have a combined final Comprehensive Exam and Thesis Defense. The Comprehensive Exam may include written and/or oral questions from any or all of the topics contained in the student's coursework. A Thesis Defense consists of a presentation of the Master's Thesis, followed by a question-and-answer session based on the 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 Thesis, the presentation, and how well he/she responds to questions from the Committee.

Ph.D. 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. A typical format includes 1-2 open-ended questions from each UA committee member; outside committee members can participate in this exam, at the discretion of the major advisor.

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 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 three weeks in advance to find a suitable date and time for the presentation and oral questions.
    - Distribute *revised* copies of the Thesis or Dissertation to the committee members; this implies that the Thesis or Dissertation has been thoroughly reviewed and approved by the major adviser.
    - 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 Thesis.
- Prepare a presentation of your Thesis or Dissertation. Graduate students' presentations of their research are often about 20-30 minutes in duration. 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

The faculty of the Department of Civil Engineering recognizes the value of publishing research findings in archival journals and through the presentation and publication of findings at technical conferences. In many cases, this streamlines the technology transfer process. Therefore, archival journal articles to stand as a dissertation or thesis – subject to University formatting guidelines and in accordance with the following:

- Ph.D. Dissertation:
    - 3 peer-reviewed; archival journal articles:
        - The Ph.D. candidate must be shown as the 1st Author on all articles;
        - At least one article must have been **accepted** for publication prior to graduation.
    - The UA Dissertation must contain all three articles, with additional text to connect the articles within the context of the overall research effort.
    - A live, on-campus Dissertation Defense is required, in accordance with UA Graduate School policies.

- M.S. Thesis:
    - 1 peer-reviewed; archival journal article:
        - The MS candidate must be shown as the 1st author on the article;
        - The article must have been submitted for review.
    - A live, on-campus Thesis Defense is required.

End of Document