

University of Central Florida
College of Engineering and Computer Science
Civil, Environmental & Construction Engineering
Department

MASTER'S STUDENT HANDBOOK

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INTRODUCTION

Promoting student success is a primary goal in the Civil, Environmental and Construction Engineering (CECE) Department. This serves in the best interest of the students, the department and the university. This Graduate Handbook was created to serve as a guide for Masters and Doctoral students (as well as faculty and staff) within the CECE department. In this handbook, we have consolidated and explained many of the details of the graduate student policies and procedures at UCF, as well as specific rules within the department. The objective of the Graduate Handbook is to provide effective direction and guidance to graduate students that will lead to their success at UCF. Since the Graduate Catalog serves as a source for general policies, it does not explain in great detail the CECE programs, their policies and procedures, and the intricacies that play into them. Note that UCF graduate policies change frequently; for the latest (and very complete) listing of graduate policies please see <http://www.students.graduate.ucf.edu/CurrentGradCatalog/content/Policies/GenPolicies.cfm>. As a supplement to the Graduate Catalog, this Graduate Handbook is more detailed and specific to the students within this department. Of course, in all cases where the two documents appear to disagree, the Graduate Catalog is UCF's official position and is the final authority.

Civil, Environmental and Construction Engineering are all broad fields, each with sub-disciplines and specializations. At UCF, because of their many interactions and common interests, they are housed in one department – the CECE Department. Construction Engineering is relatively new in the department. Accordingly, as of 2008-2009, the Department offers Master's and PhD programs in Civil or Environmental Engineering. Research centers that are affiliated with the CECE Department include the Center for Advanced Transportation Systems Simulation (CATSS), the Environmental Systems Engineering Institute (ESEI), the Florida Sinkhole Institute (FSI), and the Stormwater Management Academy (SMA).

Graduate work and research in Civil Engineering reflects the very broad nature of the field, which encompasses the design, construction, and enhancement of the infrastructure of society. The educational programs focus on structural analysis and design, geotechnical engineering and foundations, transportation planning/operations/engineering, and water resources engineering. Our mission is to provide students with a strong graduate engineering education with a focus in one of the main areas of civil engineering. Students completing the program find positions in engineering consulting firms, construction industries, and in city, county, state, and federal governmental agencies.

The Environmental Engineering graduate program focuses on pollution control, pollution prevention, and the correction of pollution impacts on natural and/or human environments. The program includes coursework in drinking water treatment, wastewater treatment, solid and hazardous waste management, atmospheric pollution control and modeling, community noise abatement, water resources modeling, and water resources. The program's overall mission is to

prepare students for careers in consulting; federal, state, and local governments; higher education; and industry. Our key objectives include: producing graduates who have strong technical knowledge in critical areas of environmental engineering, providing a professional engineering education that challenges our graduates to think critically, and developing awareness of the changing environmental needs of society and the global environment.

Civil Engineering faculty research interests include geotechnical studies of subsurface conditions, soil testing, pavement and pavement materials testing, deep foundations testing, “superpave” mix design, intelligent transportation systems, traffic engineering, traffic safety, structural dynamics, structural health monitoring, nonlinear structural analysis and software development, reinforced concrete structures, hydraulic modeling, coastal ocean modeling, stormwater management, and watershed management. The Environmental Engineering faculty research interests include drinking water treatment, wastewater treatment, stormwater quality control, air pollution control and modeling, solid waste engineering, and community noise control and modeling.

The objective of this Handbook is to help students understand the process of completing a graduate education in the CECE department at UCF, provide information on resources that will help them develop academically and professionally, and to define expectations required to complete the degree program. The handbook will also serve as a reference tool to guide graduate students through their graduate program and help students stay on track for degree completion. It will also help faculty and staff to better guide those students.

The Graduate Catalog is the university’s official record of graduate policies, and this Graduate Handbook must be consistent with university policy. In any case where the two documents appear to disagree, the Graduate Catalog is the final authority. In this graduate handbook we sometimes will reference directly to the Graduate Catalog on policies that are comprehensive and intricate in detail, providing only a short description of the policy then giving the direct website link to the section of that particular policy.

If anyone has any questions about the content of this handbook, please do not hesitate to contact the CECE department Graduate Coordinator at 407-823-2841.

1. MISSION STATEMENT

The mission of our department's graduate programs is to prepare graduate students to succeed in careers in civil or environmental engineering in such diverse employment opportunities as consulting, industry, governments at all levels, and/or higher education. Broadly speaking, the department's mission includes teaching, research and service. All graduate students receive formal education by being taught in classroom settings. In addition, many actively participate in research projects under faculty supervision, thus receiving informal instruction in the planning and conducting of research. Through this research, they also contribute to their own education and to the success of the department's research programs.

2. ORGANIZATION

The department, college, and university are organized for graduate studies through a number of groups of faculty, administration, and staff. UCF has a central Office of Graduate Studies. The College has a Vice-President and Dean for Graduate Studies, and several dedicated staff personnel. The department has a full-time graduate administrative assistant, and a graduate coordinator who is also a faculty member. Other departmental and college staff members contribute to the graduate effort as well. The most important person to any graduate student is his or her faculty advisor. The faculty advisor is typically a thesis advisor, and has great influence over the student's research direction and level of effort. For the non-thesis master's students, the advisor is the graduate coordinator. Together with his or her faculty advisor the graduate student plans his or her courses and research topic. Furthermore, the faculty advisor is typically the one who commits funding to support a student on a research contract. However, many others within the department and the college play an important role in a graduate student's experience while at UCF.

The organization of the department and college for graduate studies (showing key personnel in CECE and CECS) is summarized in an organizational chart (see Appendix A). From this chart, students can see who the people are that they might need to interact with, and the capacity in which they serve. Hopefully, the chart will assist students in determining the route to take to address questions or other matters pertaining to their graduate career. Of course, in all cases, graduate students with assigned faculty advisors should start with their advisor if they have any questions or problems.

3. ADVISING/MENTORING

Advising and mentoring are two very important elements in a graduate student's career. Upon acceptance into the CECE department, graduate students are assigned a faculty advisor, who is identified to the student in the acceptance letter from the department. In most cases, the student will have indicated an area of interest in their application, and the faculty advisor will be specialized in that sub-discipline. The faculty advisor is a very

important person in the life of a graduate student. The faculty advisor will most likely end up being the student's thesis advisor.

In some cases, incoming MS graduate students will not have indicated a strong research preference, or may arrive just prior to the start of the semester, and will need to register for courses before they can meet with their advisor, or may be assigned an advisor who does not fit comfortably with the student's interests. In those cases, the student will be advised into courses for at least the first semester by the graduate coordinator. New students should meet with the graduate coordinator upon arrival at UCF if they cannot meet with their advisor.

The graduate coordinator will provide initial guidance on overall academic requirements, program and university policies and procedures, while the faculty thesis advisor serves more as a mentor providing direction on research, advice on program of study, and guidance on other areas of academic and personal life. All non-thesis master's students should contact the graduate coordinator for an initial interview (may be conducted by telephone), who may then assign an appropriate faculty advisor, or will advise the student directly.

Roles and Responsibilities:

- Faculty Advisor
 - The advisor helps the student select which courses to take.
 - The advisor (in consultation with the student) develops the student's program of study
 - The advisor directs the student's research
 - The advisor reviews and approves the student's thesis
 - The advisor often provides financial support for the student (based upon a research contract)
- Student
 - The student takes coursework as required, maintaining a minimum 3.0 GPA
 - The student maintains a full course load and works diligently to complete all requirements in a timely manner
 - The student (in consultation with the faculty advisor) develops a program of study prior to completing the first 9 hours of coursework
 - The student identifies (in consultation with the faculty advisor) a suitable research topic
 - The student works in the lab or field or other venue as needed to complete his or her research
 - The student is responsible for knowing and meeting all university deadlines, rules, and regulations – see the section titled Student's Responsibility in the Graduate Catalog, located under General Policies – see <http://www.graduate.ucf.edu/CurrentGradCatalog/content/Policies/GenPolicies.cfm>
 - In those rare cases when a student wants to change faculty advisors, the student should discuss the situation with his or her current faculty advisor first, and then request the change through the graduate coordinator. The

change must be approved by the losing faculty advisor, the gaining faculty advisor, and the graduate coordinator

4. DEGREE REQUIREMENTS

This section describes the process for degree completion. Students must follow a prescribed, yet flexible path, achieving milestones along the way. Although there is no guarantee that each student will be able to complete all the requirements, if a student is hard working and diligent, and is a full-time graduate student, he or she should be able to complete a Master's thesis program within about 1 to 2 years. For non-thesis Master's students who are working full-time and going to school part-time, it may take 3 to 6 years to achieve the degree.

a. General Description of Degree Programs

The department offers several Master's degrees. These are described as follows.

Master's Degree Programs:

- MS in Civil Engineering (M.S.C.E.)
- MS in Environmental Engineering (M.S.V.E.)
- MS – Environmental Engineering Sciences Track (M.S.)
- MS – Structural and Geotechnical Engineering Track (M.S.)
- MS – Transportation Systems Engineering Track (M.S.)
- MS – Water Resources Engineering Track (M.S.)

The Master's degrees offer students a chance to advance their knowledge above that of the undergraduate level, and a chance to begin to specialize in one of the sub-disciplines of Civil or Environmental Engineering. All Master's degrees may require that students take one or more undergraduate courses as articulation (prerequisite) if they are coming from a different undergraduate engineering or a related science field in order to become fully prepared for graduate work in Civil or Environmental Engineering.

The M.S.C.E. degree is designed for students who want a broad educational program, with some coursework from various areas of specialization. As with all our Master's degrees, there are two options for a degree program: the thesis option and the non-thesis option. The thesis option requires 24 credit hours of acceptable coursework plus 6 credit hours of thesis, and the non-thesis option requires 30 credit hours of acceptable coursework with a comprehensive final examination. (The non-thesis option is strongly recommended for part-time students).

The M.S. degrees in Civil Engineering are organized into Tracks: Structural and Geotechnical Engineering, Transportation Systems Engineering, and Water Resources Engineering. These Tracks are designed for students who want a more specialized Civil Engineering Master's degree. Either the thesis option (24 credit hours of acceptable coursework plus 6 credit hours of thesis), or the non-thesis option

(30 credit hours of acceptable coursework with a comprehensive final examination) may be followed.

The M.S.V.E. degree was created for students who have an undergraduate degree in environmental engineering or any other closely related engineering degree. Some articulation (pre-requisite) work may be required for those students coming from other disciplines of engineering. The M.S. degree in the Environmental Engineering Sciences track is for students with science, math, or similar undergraduate degrees, and usually requires that students take a number of undergraduate engineering courses as articulation (see Articulation Requirements) to become fully prepared for graduate work in environmental engineering. All applicants to the program are expected to be knowledgeable in topics including chemistry, process design, water resources, and air pollution.

Both the M.S.V.E. and the M.S.-Env Engr Sciences degrees are very similar in course content at the graduate level. Both degrees are available with the thesis option (24 credit hours of acceptable coursework plus 6 credit hours of thesis), or the non-thesis option (30 credit hours of acceptable coursework with a comprehensive final examination). The thesis option is recommended for full-time students, while the non-thesis option is for part-time students.

Master's Degrees – Thesis Option

The Master's degree programs can either be research-oriented (thesis option) or non-research-oriented (non-thesis option). The thesis option is the only option for students who are receiving a fellowship or assistantship (GTA or GRA) from the department. Therefore, it is strongly recommended for all full-time students, even those who think that they can pay for their own education.

- A minimum of twenty four (24) semester hours of approved course work along with a minimum of six (6) hours of thesis credits is required.
- No more than six hours of thesis credits will be applied toward degree requirements.
- At least 15 credit hours must be at the 6000-level (includes thesis hours).
- A maximum of 9 semester hours of graduate credit may be transferred into the program from UCF non-degree-seeking status or from regionally accredited institutions. Only grades of "B-" or better can be transferred.
- A maximum of 6 semester hours of Independent Study may be used toward the degree. Directed research credits may not be applied toward the degree.
- A minimum "B" (3.0) average must be maintained in the program of study and no more than two C+, C, C- and U grades are allowed. No D+ or lower grades are acceptable.
- A written thesis and final oral defense are required for each thesis student.
- Once six hours of thesis credits have been completed and all course work has been satisfied, the student is required to have continual enrollment in one hour of thesis until the final thesis has been received by the College of Graduate Studies (but also see next rule).
- International students have to meet all Graduate Studies and ISS rules to remain in legal standing as a full-time student throughout their tenure at UCF. To be considered full-time, after completing all coursework, students must be enrolled in three hours of thesis continuously.

Master's Thesis Committee

- The thesis committee will consist of a minimum of three members. All committee members should hold a doctoral degree and be in fields related to the thesis topic. At least two members must be department faculty (one to serve as chair). Off-campus experts, joint faculty members, adjunct faculty, and other university faculty members may serve as the third person in the committee.
- In unusual cases, with approval from the department Chair, two professors may chair the committee jointly. Joint faculty members may serve as committee chairs, but off-campus experts and adjunct faculty may not serve as committee chairs.
- All members vote on acceptance or rejection of the thesis proposal and the final thesis. The final thesis must be approved by a majority of the advisory committee

Master's Degrees – non-Thesis Option

- With a requirement of 30 semester hours of coursework, the non-thesis option is intended primarily for part-time students.
- The program requirements are the same as for the thesis option except that the thesis requirement is replaced by 6 credit hours of course work.
- An end-of-program comprehensive examination, oral or written, is required.
- An advisor is required, and he/she will review and sign the program of study, and will coordinate the comprehensive exam.

b. Articulation Course Requirements

Articulation Courses are those undergraduate courses that are pre-requisites for graduate courses. Articulation courses are required for some students, especially with backgrounds outside the discipline. These typical senior-level courses give students the appropriate level of knowledge needed to take required and elective graduate courses in the discipline. A few articulation courses may be taken via COVE, or from other schools, but most are only offered live at UCF. Articulation requirements may vary for each individual student depending on their background. Please contact a faculty advisor for more information.

Environmental Engineering majors

The following is the articulation list for students with engineering undergraduate degrees in mechanical or chemical engineering:

CWR 4101C Hydrology
 ENV 4120 Air Pollution Control
 ENV 4561 Environmental Engineering—Process Design
 Or equivalent courses

Articulation for students with undergraduate degrees in other engineering disciplines:

CWR 3201 Engineering Fluid Mechanics
 CWR 4101C Hydrology
 CWR 4203C Hydraulics
 EGN 3001 Intro to Env Engineering
 ENV 4120 Air Pollution Control
 ENV 4561 Environmental Engineering—Process Design

Or equivalent courses

Articulation for students with appropriate science or math undergraduate degrees:

Calculus through Differential Equations
CHM 2046 Chemistry Fundamentals II
CWR 3201 Engineering Fluid Mechanics
CWR 4101C Hydrology
CWR 4203C Hydraulics
EGN 3001 Intro to Env Engineering
EGN 3613 Engineering Economic Analysis
ENV 4120 Air Pollution Control
ENV 4561 Environmental Engineering—Process Design
Or equivalent courses

For students with nontechnical undergraduate degrees, articulation is quite extensive and in such cases and it is recommended that a second undergraduate degree in Environmental Engineering be completed before applying to graduate school.

Civil Engineering majors

For the MSCE degree program, appropriate articulation courses will be chosen by the department after review of the student's background.

Water Resources (M.S.)

CEG 4101C Geotechnical Engineering I
CWR 4101C Hydrology
CWR 4203C Hydraulics
EGN 3613 Engineering Economic Analysis
STA 3032 Probability and Statistics for Engineers

Transportation (M.S.)

Probability and Statistics for Engineers (STA 3032)
Engineering Economic Analysis (EGN 3613)
Transportation Engineering (TTE 4004)

Structures & Foundations (M.S.)

EGN 3310 Engineering Analysis-Statics
EGN 3321 Engineering Analysis-Dynamics
EGN 3331 Mechanics of Materials
CEG 4101C Geotechnical Engineering I
CES 4100 Structural Analysis
CES 4605 Steel Structures

CES 4702 Reinforced Concrete Structures

c. **Graduate Course Requirements**

Master's degrees are less specialized than PhD degrees, but more specialized than undergraduate degrees. Each student's coursework requirements (Program of Study) are adjusted to meet the needs and desires of the student as well as the needs of the research program. However, certain courses (core courses) are required of all Master's students within each track or discipline. The listing below shows several different programs of study depending on the main area of interest. Keep in mind that electives can be wide-ranging and not all will come from within our department.

Required Courses for Master's Programs of Study

M.S.C.E. – thesis option (30 hours – 24 credit hours of courses and 6 hours of thesis)

Required Courses—12 Credit Hours. Take one course from each of the following 4 groups:

- Geotechnical Engineering: Any CEG course at the 5000 or 6000 level (e.g., CEG 5015, CEG 5700, CEG 6115, CEG 6065, etc)
- Structural Engineering: Any CES course at the 5000 or 6000 level (e.g., CES 5325, CES 5606, CES 5706, CES 6715, CES 6840, etc.)
- Transportation Engineering: Any TTE course at the 5000 or 6000 level (e.g., TTE 5204, TTE 5805, TTE 6270, TTE 6315, etc.)
- Water Resources Engineering: Any course at the 5000 or 6000 level (e.g., CWR 5205, CWR 5545, CWR 5125, CWR 6102, CWR 6126, CWR 6235, CWR 6236, CWR 6532, CWR 6535, CWR 6539, etc.)

Elective Courses – 12 credit hours. Take 4 more courses (12 hours) of approved electives (see your advisor for approval) plus do a thesis (6 hours)

M.S.C.E. – non-thesis option (30 hours – 30 credit hours of courses)

Required Courses—24 Credit Hours. Take two courses from each of the following four groups:

- Geotechnical Engineering: Any CEG course at the 5000 or 6000 level (e.g., CEG 5015, CEG 5700, CEG 6115, CEG 6065, etc)
- Structural Engineering: Any CES course at the 5000 or 6000 level (e.g., CES 5325, CES 5606, CES 5706, CES 6715, CES 6840, etc.)
- Transportation Engineering: Any TTE course at the 5000 or 6000 level (e.g., TTE 5204, TTE 5805, TTE 6270, TTE 6315, etc.)
- Water Resources Engineering: Any course at the 5000 or 6000 level (e.g., CWR 5205, CWR 5545, CWR 5125, CWR 6102, CWR 6126, CWR 6235, CWR 6236, CWR 6532, CWR 6535, CWR 6539, etc.)

Elective Courses – 6 credit hours. Take 2 more courses (6 hours) of approved electives (see your advisor for approval) plus do a comprehensive final exam

M.S.EnV.E. – thesis (30 hours) or non-thesis (30 hours)

Required Courses – 15 hours. Take 5 courses (15 hours) from the following (must take one from each bulleted group):

- Any CWR course at the 5000 or 6000 level (3 credit hours)
- ENV 6015 Physical/Chemical Treatment Systems in Environmental Engineering (3 credit hours)
- ENV 6016 Biological Treatment Systems in Environmental Engineering (3 credit hours)
- ENV 6347 Hazardous Waste Incineration (3 credit hours) or ENV 6558 Industrial Waste Treatment (3 credit hours) or EES 5318 Industrial Ecology
- ENV 6106 Theory and Practice of Atmospheric Dispersion Modeling (3 credit hours) or ENV 6126 Design of Air Pollution Controls (3 credit hours)

Elective Courses – 9 or 15 hours. For thesis option, take 3 more courses (9 hours) of approved electives plus do a thesis (6 hours), OR, for non-thesis option, take 5 more courses (15 hours) of approved electives plus a comprehensive final exam.

M.S. – Env. Engr. Sciences – thesis (30 hours) or non-thesis (30 hours)

Required Courses: Take 4 courses (12 hours) from the following list (must take one from each bulleted group):

- Any CWR course at the 5000 or 6000 level (3 credit hours)
- ENV 6015 Physical/Chemical Treatment Systems in Environmental Engineering (3 credit hours) or ENV 6016 Biological Treatment Systems in Environmental Engineering (3 credit hours) or ENV 6558 Industrial Waste Treatment (3 credit hours)
- ENV 6106 Theory and Practice of Atmospheric Dispersion Modeling (3 credit hours) or ENV 6126 Design of Air Pollution Controls (3 credit hours) or ENV 6347 Hazardous Waste Incineration (3 credit hours)
- ENV 5071 Environmental Analysis of Transportation Systems (3 credit hours) or ENV 6519 Aquatic Chemical Processes (3 credit hours) or ENV 6616 Receiving Water Impacts (3 credit hours) or EES 5318 Industrial Ecology (3 credit hours)

Elective Courses - 12 or 18 hours. For thesis students, take 4 more courses (12 hours) of approved electives plus do a thesis (6 hours) OR, for non-thesis students, take 6 more courses (18 hours) of approved electives plus a comprehensive final exam.

M.S. – Structures and Geotechnical Engineering – thesis (30 hours) or non-thesis (30 hours)

Required Courses: Take 4 courses (12 hours), 2 each from each of the following two sub-Groups:

Sub-Group A: Geotechnical Engineering

- CEG 5015 Geotechnical Engineering II (3 credit hours)
- CEG 5700 Geo-Environmental Engineering (3 credit hours)
- CEG 6065 Soil Dynamics (3 credit hours)
- CEG 6115 Foundation Engineering (3 credit hours)
- CEG 6317 Advanced Geotechnical Engineering (3 credit hours)
- CES 6170 Boundary Element Methods in Civil Engineering (3 credit hours)
- TTE 5835 Pavement Design (3 credit hours)

Sub-Group B: Structural Engineering

- CES 5325 Bridge Engineering (3 credit hours)
- CES 5606 Advanced Steel Structures (3 credit hours)
- CES 5706 Advanced Reinforced Concrete (3 credit hours)
- CES 5821 Masonry and Timber Design (3 credit hours)
- CES 6116 Finite Element Structural Analysis (3 credit hours)
- CES 6209 Dynamics of Structures (3 credit hours)
- CES 6220 Wind and Earthquake Engineering (3 credit hours)
- CES 6230 Advanced Structural Mechanics (3 credit hours)
- CES 6715 Prestressed Concrete Structures (3 credit hours)
- CES 6840 Composite Steel Concrete Structures (3 credit hours)
- CES 6910 Research in Structural Engineering (3 credit hours)

Elective Courses – 12 or 18 hours. For thesis students, take 4 more courses (12 hours) of approved electives plus do a thesis (6 hours) OR, for non-thesis students, take 6 more courses (18 hours) of approved electives plus a comprehensive final exam.

M.S. – Transportation Systems Engineering – thesis (30 hours) or non-thesis (30 hours)

I. Thesis option:

Required courses (5 courses for 15 hours)

Students must take five (5) of the following courses

- TTE 5204 Traffic Engineering (3 credit hours)
- TTE 6205 Highway Capacity and Traffic Flow Analysis (3 credit hours)
- TTE 5805 Geometric Design of Transportation Systems (3 credit hours)
- TTE 5835 Pavement Design (3 credit hours)
- TTE 6256 Traffic Operations (3 credit hours)
- TTE 6270 Intelligent Transportation Systems (3 credit hours)
- TTE 6315 Traffic Safety Analysis (3 credit hours)
- TTE 6526 Planning and Design of Airports (3 credit hours)
- CGN 6655 Regional Planning, Design and Development (3 credit hours)
- ENV 5071 Environmental Analysis of Transportation Systems (3 credit hours)
- STA 5156 Probability and Statistics for Engineers **or** STA 5206 Statistical Analysis **or** ESI 5219 Engineering Statistics (3 credit hours)

Elective Courses (3 courses for 9 hours)

Students must take three more courses which must be approved by their advisor.

II. Non-Thesis option:

Coursework: 30 Semester Hours (10 courses), Comprehensive Exam

Required Courses (5 courses for 15 hours)

Students choose any five (5) of the following courses:

- TTE 5204 Traffic Engineering (3 credit hours)
- TTE 6205 Highway Capacity and Traffic Flow Analysis (3 credit hours)
- TTE 5805 Geometric Design of Transportation Systems (3 credit hours)
- TTE 5835 Pavement Design (3 credit hours)
- TTE 6256 Traffic Operations (3 credit hours)
- TTE 6270 Intelligent Transportation Systems (3 credit hours)
- TTE 6315 Traffic Safety Analysis (3 credit hours)

- TTE 6526 Planning and Design of Airports (3 credit hours)
- CGN 6655 Regional Planning, Design and Development (3 credit hours)
- ENV 5071 Environmental Analysis of Transportation Systems (3 credit hours)
- STA 5156 Probability and Statistics for Engineers **or** STA 5206 Statistical Analysis **or** ESI 5219 Engineering Statistics (3 credit hours)

Electives (5 courses for 15 hours)

Students must take five (5) additional courses. The electives should come preferably from the above list, but may include other courses with Adviser's consent.

M.S. – Water Resources Engineering – thesis (30 hours) or non-thesis (30 hours)

Required Courses (any five CWR courses – 15 credit hours):

- CWR 5205 Hydraulic Engineering (3 credit hours)
- CWR 5515 Numerical Methods in Civil & Environmental Engineering (3 credit hours)
- CWR 5545 Water Resources Engineering (3 credit hours)
- CWR 5125 Groundwater Hydrology (3 credit hours)
- CWR 6235 Open Channel Hydraulics (3 credit hours)
- CWR 6236 River Engineering and Sediment Transport (3 credit hours)
- CWR 6535 Modeling Water Resources Systems (3 credit hours)
- CWR 6102 Advanced Hydrology
- CWR 6126 Groundwater Modeling
- CWR 6539 Finite Elements in Surface Water Modeling (3 credit hours)
- CWR 6532 Modeling Subsurface Chemical Transport

Elective Courses – 9 or 21 hours. For thesis students, take 3 more courses (9 hours) of approved electives plus do a thesis (6 hours) **OR**, for non-thesis students, take 5 more courses (15 hours) of approved electives plus a comprehensive final exam.

d. Examinations

o **Master's Students:**

(see <http://www.graduate.ucf.edu/CurrentGradCatalog/content/Policies/Masters.cfm>)

Thesis Students: after conducting research and writing the thesis, the student will defend the thesis, and stand for an oral examination. Questions will come from the committee and may cover topics other than what was done in the research (e.g., topics from courses taken). The committee has the final say on whether the student passes or fails. If failed, this exam may be re-taken once at the discretion of the committee.

Non-thesis Students: In the last semester of coursework, the student must contact his or her faculty advisor or the graduate coordinator to schedule the comprehensive final exam. The exam will consist of questions that represent knowledge that should have been gained from the various courses taken by the student. The exam may be open or closed book or have questions of both types. If failed, this exam may be re-taken once.

e. Approximate Timeline for Completion of Degree Program

The following listing is intended as a guide and reminder to students and faculty as to the approximate timing of events for graduate students. It is intentionally somewhat

vague to account for different starting semesters, different research project needs, and different levels of student capabilities.

Master's Students (Thesis):

Semester 1: Enter UCF, and begin taking courses. Take articulation courses (if needed) first. If you are not already on a research project at the time of entry, begin searching for a research project and research advisor.

Semester 2: Find a research advisor and start research, complete articulation courses (as needed), continue taking grad courses, file Program of Study.

Semester 3: Begin working in earnest on research; start literature review; perhaps finish coursework. Work with advisor to form a committee.

Semester 4: Finish coursework; begin wrapping up research; start writing thesis.

Last Semester: File intent to graduate. Finish writing thesis, get approvals from committee, and defend. Follow all Grad Studies rules and meet all deadlines. –

Note: Students are ultimately responsible for their own progress or lack of progress, including compliance with all rules and regulations of the University.

Master's Students (non-Thesis):

Semester 1: Enter UCF, begin taking courses on a part-time basis.

Semesters 2 and 3: Pick an advisor, design a Program of Study. Continue taking courses.

Semesters 4 – ??: Take courses, maintaining acceptable grades. In semester before last, request scheduling of the comprehensive final exam. NOTE there is a UCF rule (7-year statute of limitations on courses), so try to finish all your courses in 4 or 5 years.

Last Semester: File intent to graduate, take and pass comprehensive final exam.

Follow all Grad Studies rules and meet all deadlines. – Note: Students are ultimately responsible for their own progression, including compliance with all rules and regulations of the University.

f. Graduate Research

Research is a vital part of graduate education, particularly for doctoral students. The development of research skills and the practice of good research ethics begins with graduate study. Faculty serve a crucial role and are the primary source for teaching research skills and modeling research ethics.

1. In the CECE department, much of our research is carried out as a part of Contracted Sponsored Research. Faculty obtain sponsored research from many different government agencies, and/or industry, and thus commit the university to doing certain research tasks. Students are typically hired to help the faculty conduct the research, and as such are contractually obligated to give their “best efforts” to accomplishing the research tasks. In most cases, students who are supported on contracts may use the results of their work as the basis for their thesis.

2. Thesis– this document may be among the biggest academic efforts that you will ever make. As of the writing of this handbook, it is required that all theses be officially submitted to the Graduate School in electronic form. It is highly recommended that you (the student) discuss format and content with your advisor, and carefully review other theses before you get started. The Graduate Studies web site has some helpful hints with regard to formats for the electronic version of these documents. Please see <http://www.graduate.ucf.edu/formsnfiles/index.cfm?FileRescArea=30&FileStcp2=Show%2BFiles> .
3. It is important to be honest and ethical in conducting research as well as in taking classes. Report all data factually and completely. Please see [http://www.graduate.ucf.edu/CurrentGradCatalog/content/About UCF/universityNotices.cfm#Academic Behavior Standards](http://www.graduate.ucf.edu/CurrentGradCatalog/content/About%20UCF/universityNotices.cfm#Academic%20Behavior%20Standards)
4. Patents and inventions may arise from the faculty and graduate student research. UCF has clear guidelines and a Patent and Invention Policy in the Graduate Catalog. Please see [http://www.graduate.ucf.edu/CurrentGradCatalog/content/Policies/GenPolicies.cfm#Patent and Invention Policy](http://www.graduate.ucf.edu/CurrentGradCatalog/content/Policies/GenPolicies.cfm#Patent%20and%20Invention%20Policy)
5. Students should be aware that in our department, we require that theses be written in a journal article format. The Graduate Student Association of UCF conducts workshops on thesis and dissertation formatting, library research, and writing essentials. Students, when beginning to write their thesis, should always contact the thesis/dissertation editor in the College of Graduate Studies. Please see <http://www.graduate.ucf.edu/sitemap/index.cfm?RsrcID=55&SubCatID=144>.
4. It is highly recommended that each student coordinate with his or her faculty advisor as to the preferred journal format, prior to beginning to write the thesis.
6. Non-thesis Master's students must take and pass a final comprehensive exam in order to graduate. Please see Section 4.d. (above) for the timing and scope of these exams.
7. There are specific Laboratory Safety Procedures that must be followed by each student working in a lab in the CECE Department. It is department policy that each student is responsible for knowing and following the Safety Procedures. Please see the laboratories manager and/or your faculty advisor to get a copy of the Safety Procedures for the appropriate lab.

5. DEGREE PROGRAM (or PLAN) OF STUDY

The Program of Study (POS) serves as an agreement between the student and the program, listing course and other requirements for completing the degree. Each student must have an approved Program of Study (POS). The POS is developed by the student and his/her advisor, and lists the specific courses to be taken as part of the degree requirements. The student must maintain a minimum GPA of 3.0 in his or her POS. For interactive PDF format POS forms, please see the CECE department's web page: <http://cece.ucf.edu>

For all Master's students, the POS must be signed and submitted during the first semester that the student is at UCF, or no later than upon completion of 9 hours of graduate coursework. The POS can be revised later to reflect necessary changes in the courses, but it is crucial that a POS be on file, signed by the student and the faculty advisor, and approved by the Graduate Coordinator. For each Master's program, certain courses are required and others are elective (as was discussed previously). Any substitutions must be approved by the Graduate Coordinator. Please see also <http://www.graduate.ucf.edu/pagegen/index.cfm?PageID=21>.

6. GRADUATION

Graduation is the culmination of a challenging and arduous journey in the pursuit of a higher degree. To get to this pinnacle, it takes dedication, sacrifice, and hard work (and meeting all the bureaucratic processes and deadlines of UCF). In order to eliminate or reduce the potential for any unnecessary delays or complications with graduation, each student must be aware of and comply with all degree requirements and deadlines, and must submit all necessary forms on time.

University requirements for courses, numbers of hours, etc. were presented earlier in Section 4 above. The student is responsible for keeping up with his or her course records and knowing where they are in the program. In the last semester (the semester in which the student plans to graduate), several further steps must be taken, as explained below.

1. Submit the Intent to Graduate form by the Graduation Application deadline listed in the academic calendar (see <http://www.registrar.sdes.ucf.edu/calendar/academic/>).
2. Finish writing the thesis early enough to allow time for committee to review well before the defense deadline.
3. Obtain format review and approval by the graduate studies thesis editor before giving copies to the committee.
4. If a non-thesis student, request the comprehensive exam within the first 2 weeks of the start of the graduating semester.
5. Contact each member of the thesis committee to schedule a date for the defense.
6. Coordinate with the graduate secretary in the department to ensure that your SASS audit is "clean".
7. Complete clean up of lab space (after you have passed the exam and have been told that no more work is needed), and check out with the lab manager.

7. GENERAL POLICIES

In this section, we recap some program and university general policies that commonly affect the majority of graduate students. For the final word on policies, please see the

Graduate Catalog. For Master's Programs, see:

<http://www.graduate.ucf.edu/CurrentGradCatalog/content/Policies/Masters.cfm>

- Satisfactory academic performance means that you must maintain a GPA of 3.0 in your graduate POS, with no more than 2 'C' grades (balanced by at least 2 'A' grades).
- Satisfactory academic progress toward degree completion means that you take a full course load each semester (typically 9 hours per Fall and Spring, and 6 hours in Summer) until you complete all courses.
- The department will accept no more than 9 hours of transfer credits for Master's students. These include courses taken at UCF if taken as a non-degree seeking student. No courses with grades less than B- can be accepted.
- Each research lab has a policy on laboratory safety. Please coordinate directly with the labs manager on this if you work in a lab.
- All graduate students are expected to abide by UCF's Golden Rule. See <http://www.goldenrule.sdes.ucf.edu/index.html>
- Students have available an Academic Grievance Procedure. See <http://www.graduate.ucf.edu/CurrentGradCatalog/content/Policies/GenPolicies.cfm#Academic Grievance Procedure>
- Certificates may be available to some students. Typically, Certificate students are students who do not qualify to enter the Master's program directly. In a few cases, Master's students who cannot complete the Master's program (e.g., due to a job transfer) but who have completed four graduate courses, can apply for the Certificate program. Students must be admitted to the Certificate program before applying for completion of a Certificate. For more information, please see Graduate Certificate Program policies in <http://www.graduate.ucf.edu/CurrentGradCatalog/content/Policies/GradCert.cfm>
- Students may withdraw from a class meeting all conditions stated in the Graduate Catalog. However, this may result in loss of tuition waiver, and, for international students, this may place them in jeopardy of being considered out of status. See <http://www.graduate.ucf.edu/CurrentGradCatalog/content/Admissions/index.cfm>

8. PROFESSIONAL DEVELOPMENT

In this section, we identify university resources available to students for professional development. A graduate student's professional development goes beyond completing course work, passing exams, conducting research for a thesis, and meeting degree requirements. Professional development also involves developing the academic and non-academic skills needed to become successful in the field of choice. Please see <http://www.graduate.ucf.edu/CurrentGradCatalog/content/Policies/GenPolicies.cfm#Academic Grievance Procedure > Professional Development Opportunities>

- UCF has an active professional development program for graduate students, including the Professoriate Program, sponsored by Faculty Center for Teaching and Learning, the GTA Certificate Program, sponsored by FCTL, the Graduate Student

Association Seminar Series, the Graduate Research forum, sponsored by the College of Graduate Studies, and special award recognitions such as the Award for Excellence by a Graduate Teaching Assistant, the Award for Excellence in Graduate Student Teaching, the Award for the Outstanding Master's Thesis, and the Award for the Outstanding Dissertation (see section below for more information)

- Doctoral students intending to pursue a career in academia have the opportunity to develop grant-proposal writing skills by working closely with faculty mentors,
- Students are expected to publish the results of their research. In fact, the CECE department strongly encourages students to write their thesis or dissertation in the journal paper format.
- Graduate students in CECE are encouraged to present a poster or a topic of research at conferences while still a student, and often their faculty mentor will be able to fund one or more such opportunities. Also, see below for travel support.

Travel Support

The College of Graduate Studies offers a Graduate Travel Award that provides funding for master's, specialist, and doctoral students to deliver a research paper or comparable creative activity at a profession meeting. Students must be the primary author and presenter.

www.graduate.ucf.edu > Current Students > Financial Matters

Graduate Students Travel Funding is available to pay transportation expenses for graduate students who are delivering a research paper or comparable creative activity at a professional meeting. Contact the Student Government Association at 407/823-5648 for more information.

Instructor Training and Development

The Faculty Center for Teaching & Learning (FCTL) promotes excellence in all levels of teaching at the University of Central Florida. To that end, they offer several programs for the professional development of Graduate Teaching Assistants at UCF.

- **GTA Training (mandatory for employment as a GTA)**
This training provides information and resources for students who will be instructors in a two-day workshop. The seminars cover a variety of topics, including course development, learning theories, lecturing, and academic freedom. Those interested in additional training can also attend an optional training session that normally follows the mandatory training.
- **GTA Teaching Certificate**
This certificate program (12-weeks for domestic students, 16-weeks for international students) consists of group and individualized instruction by Faculty Center staff and experienced UCF professors. Textbooks and materials are provided, and a stipend is offered to current UCF students who complete the certificate. International students are provided the same training as well as information regarding language immersion and tricks and cultural awareness as a way of knowing what to expect from American students.

For more information <http://www.fctl.ucf.edu/> > Events > GTA Programs or call 407/823-3544.

Graduate Excellence Awards

Each year, students can submit a portfolio for nomination of College and University level awards of excellence. These are intended to showcase student excellence in academic achievement, teaching, research, leadership, and community service.

These awards include the following:

- **Award for Excellence by a Graduate Teaching Assistant**
For students who provide teaching support and assistance under the direction of a lead teacher. This award focuses on the extent and quality of the assistance provided by the student to the lead instructor and the students in the class. (Not intended for students who are instructor of record)
- **Award for Excellence in Graduate Student Teaching**
For students who serve as instructors of record and have independent classroom responsibilities. The focus of this award is on the quality of the student's teaching and the academic contributions of those activities.
- **Award for the Outstanding Master's Thesis**
To recognize graduate students for excellence in the master's thesis. The focus of this award is on the quality and contribution of the student's thesis research. Excellence of the master's thesis may be demonstrated by evidences such as (but not limited to): publications in refereed journals, awards and recognitions from professional organizations, and praise from faculty members and other colleagues in the field. The university award will be forwarded to a national-level competition sponsored by the Council of Southern Graduate Schools (CSGS) when the thesis discipline corresponds to the annual submission request.
- **Award for the Outstanding Dissertation**
To recognize doctoral students for excellence in the dissertation. The focus of this award is on the quality and contribution of the student's dissertation. Excellence of the dissertation may be demonstrated by evidences such as, but not limited to: publications in refereed journals, awards and recognitions from professional organizations, and praise from faculty members and other colleagues in the field.

For more information about these awards, please see the College of Graduate Studies administrative website: www.graduatestudies.ucf.edu > Graduate Awards.

For more information about the Council of Southern Graduate Schools (CSGS) thesis and dissertation awards, please see their website: <http://www.csgs.org/> > Awards.

9. FINANCIAL SUPPORT

Financial support is a major concern for graduate students, especially since many rely on financial support from the university to pursue graduate study. In combination, the college, the university, and the Department provide financial assistance to graduate students in several ways: (1) fellowships and scholarships are available to academically outstanding students, (2) Graduate Teaching Assistantships – GTA's (for grading or for lab teaching) are available in limited numbers, (3) Graduate Research Assistantships – GRA's (for helping faculty with research) are more widely available depending on the funding levels of the faculty. Students must maintain satisfactory academic progress (including a GPA of 3.0 and a full course load), and do acceptable research or grading or teaching work to maintain their financial support.

- All students are expected to maintain a 3.0 GPA in their Program of Study. They must not make any more than two 'C' grades, and those must be balanced with two 'A' grades. Students on contract are expected to work 10 to 20 hours per week on their assigned tasks (whether it be grading, lab teaching, or research), while they are maintaining satisfactory progress in completing their academic courses. All GTA's (especially international students) that have any contact with undergraduate students must take all training required by Graduate Studies. For Fall of 2008, these training modules include:
 - Fall 2008 GTA Training
<http://www.graduate.ucf.edu/pagegen/index.cfm?PageID=154>
 - SPEAK Exam (international students only)
<http://www.graduate.ucf.edu/pagegen/index.cfm?PageID=160>
 - GTA Legal Module (online beginning in June)
- Students must meet their obligations (making satisfactory progress towards their degree, maintaining a 3.0 in their POS, doing satisfactory work for their research advisor) to continue to receive their financial support. If the students are on time cards, the cards must be filled out properly and filed on time. If they are on contract, they must maintain satisfactory work as defined by their supervisor. Also, being on contract requires that the students register for the proper number of hours of classes in time to process tuition waiver and so forth
- The duration of financial support may vary from one semester at a time to up to a 4-year renewable fellowship
- International students are expected to be here as full-time students, and may not work off campus except under very strict conditions. Please see <http://www.graduate.ucf.edu/CurrentGradCatalog/content/Policies/GenPolicies.cfm#InternationalStudentEmployment>

10. MISCELLANEOUS

- Departmental Faculty and Staff (all are located in the CECE office Suite – EN-2, Room 211; the main phone number is 407-823-2841):
 - Dr. Lakshmi Reddi – chair
 - Dr. Mohamed Abdel-Aty – graduate coordinator

- Carol Ann Pohl – undergrad advisor
- Margarida Trim – admissions, programs of study, thesis/dissertation announcements, SASS audits, graduation certifications
- Anna Marie Keyek – purchasing, , contracts administrator, tuition waiver
- Pauline Strauss – undergraduate records, travel, other duties as needed
- Department and college resources:
 - The CECE Department provides office space, desks, etc. (Dept Chair makes assignments)
 - The department provides computers and software to all full-time graduate students (provided as part of office assignment; may be upgraded by research advisor)
 - The department provides campus mailboxes to graduate students (see Pauline Strauss)
 - The department has available telephones, and copy and fax machines (for university business) for use by graduate students, as authorized by research advisor.
 - UCF provides internet access and email accounts
- UCF provides University resources for students. Some examples are:
 - Library <http://library.ucf.edu> 407-823-2756
 - Computer facilities www.acs.ucf.edu 407-823-2713
 - Student Associations and Student Support Groups. Note all student organizations at UCF are listed at:
<http://www.osi.sdes.ucf.edu/clubsorgs/clubsorgshome.html>
 - Campus social life <http://www.gsa.graduate.ucf.edu/>
 - University Writing Center <http://www.uwc.ucf.edu/>
 - The Counseling Center <http://counseling.sdes.ucf.edu/welcome.html>
- The Academic Calendar can be found at http://www.ucf.edu/info/acad_calendar.php
- Most of the faculty in the department are active in research. Their areas and current research projects can be found by starting on the department home page www.cece.ucf.edu and clicking on the “People” link

11. FORMS

During their career at UCF, graduate students will be required to complete forms to progress through their degree program. The most relevant forms are listed below, and a complete listing can be found at <http://www.graduatelstudies.ucf.edu/formsnfiles/>

Program of Study – must be filed and signed within the first 9 hours of graduate coursework (may be amended later). For the CECE Department, the student may download a preliminary POS form from the Department web site at <http://cece.ucf.edu>

Contracted Graduate Assistant – Offer of Appointment – contract allowing a grad student to be hired and paid for teaching assistance in the department or for working as a research assistant for a professor. These must be signed prior to the beginning of the semester, and influence how much tuition waiver you will get

Graduate Petition Form – required for petitioning old courses into your program, and for numerous other requests for waivers or extensions

Intent to Graduate Form – a most important form for students!

Transfer Request Form – used for transferring courses from other institutions into your program of study

Appendix A:
College of Engineering and Computer Sciences –
Graduate Programs in Civil and Environmental Engineering (CECE)

Organizational Chart: Graduate Programs in CECE

