

Institute Graduate Curriculum Committee

Minutes

Academic Matters (Full Committee)

Thursday, January 14, 2016

Present: Breedveld (CHBE), Pikowsky (Registrar), Balch (CoC-Executive Board Liaison), Chow (CoC-CSE), Cozzens (Vice Provost), Flowers (ARCH), Jagoda (AE), Miller (GCC Student Representative), Neitzel (ME), Omiecinski (CoC-CS), Schmidt-Krey (BIOL), Sluss (CoB)

Visitors: Hodges (REG), Cole (REG), Ortiz (GTRI), Bamburowski (Grad Studies), Wooley (GTPE), Williams (ECE), Riley (ECE), White (CoC), Bracco (EAS), Dovrolis (CoC), Di Lorenzo (CoS), Irizarry (BC), Castro (BC)

Note: All action items in these minutes require approval by the Academic Senate. In some instances, items may require further approval by the Board of Regents or the University System of Georgia. If the Regents' approval is required, the change is not official until notification is received from the Board to that effect. Academic units should take no action on these items until USG and/or BOR approval is secured. In addition, units should take no action on any of the items below until these minutes have been approved by the Academic Senate or the Executive Board. It may also be that approval of the Southern Association of Colleges and Schools is also required.

Academic Matters

1. A motion was made to *approve* a request from the College of Computing for a new course. This motion was seconded and approved.

New Course - APPROVED

CS 7280: Network Science

3-0-3

(The NCP was updated to clarify that all grade modes were able to be selected for this course).

A motion was made to *approve* a request from the College of Computing for a degree modification. This motion was seconded and approved.

Degree Modification - APPROVED

Master of Science in Computer Science: Computing Systems concentration

The College of Computing proposed to add CS 6235(elective course) to the Computing Systems concentration. It was supposed to be included as an elective in Proposal 4692, but was inadvertently left off the list.

Computing Systems Concentration

Core courses (9 hours)

CS 6505 Computability, Algorithms, and Complexity

And, pick two (2) of:

CS 6400, Introduction to Database Systems

CS 6210, Advanced Operating Systems

CS 6241, Compiler Design

CS 6250, Computer Networks

CS 6290, High-Performance Computer Architecture

CS 6300, Software Development Process

Electives (9 hours)

Pick three (3) courses from:

CS 6035 Introduction to Information Security

CS 6235 Real Time Systems

CS 6238 Secure Computer Systems

CS 6260 Applied Cryptography

CS 6262 Network Security

CS 6310 Software Architecture and Design

CS 6340 Software Analysis and Testing

CS 6365 Introduction to Enterprise Computing

CS 6422 Database System Implementation

CS 6550 Design and Analysis of Algorithms

CS 6675 Advanced Internet Computing Systems and Applications

CS 7210 Distributed Computing

CS 7260 Internetworking Architectures and Protocols

CS 7270 Networked Applications and Services

CS 7290 Advanced Topics in Microarchitecture

CS 7292 Reliability and Security in Computer Architecture

CS 7560 Theory of Cryptography

CS 8803-FPL Special Topics: Foundations of Programming Languages

2. A motion was made to *approve* a request from the School of Electrical and Computer Engineering for a degree modification. This motion was seconded and approved.

Degree Modification – APPROVED

The vote was not unanimous. There was one vote to abstain.

Master of Science in Electrical and Computer Engineering

Summary

The Master of Science will be adding a new required course in “Entrepreneurship” for 3 credit hours which will be taught as a Special Topics (ECE 8883) course for at least two terms and then pursuing a permanent course number of ECE 6899. We are deleting our existing requirement for what we call a “minor”, which in our case means 6 credit hours (2 courses) in another engineering discipline or science discipline which must be in similar topical areas for the two courses. Add one new “Approved Elective” for 3 credit hours. Ultimately the total number of credit hours remains the same. The reason for the change is based on feedback from alumni, industry partners, and advisory board members.

We have gotten significant feedback both from students and our industry partners that we need to better train our graduate students in non-technical issues regarding workforce interactions, teamwork activities, technical project management and other issues related to the life after graduating.

Summary of Current M.S.E.C.E. Degree Requirements

Graduate students in the School of Electrical and Computer Engineering may pursue the designated Master of Science in Electrical and Computer Engineering (M.S.E.C.E.) degree. The academic requirements for this degree are summarized below.

M.S.E.C.E. Non-Thesis option

REQUIREMENT	HOURS	COMMENTS
Group I: Graduate-level (6000) ECE Hours:	9	Three classes in one or two technical interest areas of the student's choosing. All hours for letter grade credit.
Group II: Additional ECE Graduate-level (6000) Hours:	9	At least six (6) hours must be outside the technical area(s) above. These six hours may not be cross-listed with the technical interest area(s) above. All hours for letter grade credit.
Minor (outside ECE) Hours:	6	Minor classes must be taken for a letter grade, in a single discipline, and not cross-listed with ECE
Electives (may be	6	

outside ECE);

Total hours required: 30

Further requirements: Classes used toward the M.S. degree must have grades of "C" or higher. At least 21 hours must be at 6000 level or above; no more than 6 hours may be Special Problems; the electives may include up to 3 ECE seminar hours.

M.S.E.C.E. Thesis option

REQUIREMENT	HOURS	COMMENTS
Group I: Graduate-level (6000) ECE Hours:	6	Two classes in one or two technical interest areas of the student's choice. All hours for letter grade credit. All six hours must be under a technical interest area that is outside the technical area(s) above.
Group II: Additional ECE Graduate-level (6000) Hours:	6	Courses may not be cross-listed with the technical interest area(s) above. All hours for letter grade credit.
Minor (outside ECE) Hours:	6	Minor classes must be taken for a letter grade, in a single discipline, and not cross-listed with ECE
Thesis Hours	12	
Responsible Conduct of Research (RCR)		
Total hours required:	30	

Further requirements: ** New requirement starting Fall 2014 for all students who register for 7000 Thesis hours: Must complete Responsible Conduct of Research (RCR) Requirement. ****** Classes used toward the M.S. degree must have grades of "C" or higher. At least 21 hours must be at the 6000 level or above, (including ECE 7000, M.S. Thesis Research hours). No hours may be Special Problems. M.S. thesis option students must present a "research review" to their advisor and reading committee members so that the "Request for Approval of the M.S. Thesis Topic" can be approved by the committee and submitted to the ECE Graduate Affairs Office for processing.

There must be a **minimum** of 90 days between approval of the thesis topic form by the ECE Graduate Affairs Office and submission of the M.S. thesis to the reading committee for their approval. ECE does not require a defense of the M.S. thesis. However, the reading committee may require a defense. Details regarding the [M.S. thesis option are available in PDF format](#).

Both M.S. Options: The Institute permits up to 3 hours to be pass/fail (P/F) and up to 6 hours of transfer credit to be used toward a master's degree. ECE specifies that the 3 P/F hours must be ECE seminars (8001, 8002, 8003, and 6792). ECE 8022 (Professional Communication Skills) is also offered on a pass/fail basis and can be used.

Students are required to complete all degree requirements within 6 consecutive years and maintain a 2.7 GPA.

Minor field of study: Mathematics and Computer Science (4000 or 6000 level) courses are most frequently used by ECE students to fulfill the minor requirement of six hours. A [list of Math courses](#) and a [list of Computer Science](#) courses acceptable for the M.S.E.C.E. minor are on the ECE web site.

Graduate level courses from other science and engineering disciplines are considered for use toward the minor requirement. 6000 level minor courses are preferred, and 4000 level or a combination of 4000 and 6000 level courses will be considered for approval, provided the overall degree requirements are met. Some additional notes about minor fields of study are as follows:

Management minors may be approved for use toward the M.S. degree. M.S. students planning to continue on for the Ph.D. degree should note that management classes are generally not approved for the Ph.D. minor.

Summary of Revised M.S.E.C.E. Degree Requirements

Graduate students in the School of Electrical and Computer Engineering may pursue the designated Master of Science in Electrical and Computer Engineering (M.S.E.C.E.) degree. The academic requirements for this degree are summarized below.

M.S.E.C.E. Non-Thesis option

REQUIREMENT	HOURS	COMMENTS
Group I: Graduate-level (6000) ECE Hours:	9	Three classes in one or two technical interest areas of the student's choosing. All hours for letter grade credit.
Group II: Additional ECE Graduate-level	9	At least six (6) hours must be outside the technical area(s) above. These six hours may not be cross-

(6000) Hours:

listed with the technical interest area(s) above. All hours for letter grade credit.

ECE 8883: Technology Entrepreneurship	3
Electives (may be outside ECE);	9
Total hours required:	30

Further requirements: Classes used toward the M.S. degree must have grades of "C" or higher. At least 21 hours must be at 6000 level or above; no more than 6 hours may be Special Problems

M.S.E.C.E. Thesis option

REQUIREMENT	HOURS	COMMENTS
Group I: Graduate-level (6000) ECE Hours:	6	Two classes in one or two technical interest areas of the student's choice. All hours for letter grade credit. All six hours must be under a technical interest area that is outside the technical area(s) above.
Group II: Additional ECE Graduate-level (6000) Hours:	6	Courses may not be cross-listed with the technical interest area(s) above. All hours for letter grade credit.

ECE 8883: Technology Entrepreneurship	3
Electives (may be outside ECE);	3
Thesis Hours RCR	12
Total hours required:	30

3. A motion was made to *table* a request from the School Building Construction for new courses. This motion was seconded and approved.

New Courses – TABLED

The following group of courses is intended to be the primary curriculum for the Professional Masters in Occupational Safety and Health Management:

- BCP 6450: Construction Occupational Safety and Health 3-0-3
(The syllabus for this course should indicate the obvious difference between this graduate level course and the corresponding undergraduate course CEE 4130.)
- BCP 6700: Current Issues in Occupational Safety and Health 3-0-3
(It was noted by the Committee the Topics Covered area needed revision to include the topics covered during the course.)
- BCP 6800: Culture and Leadership Influences on Safety and Health 3-0-3
- BCP 6900: Economic Analysis, Risk Management Financing and Insurance for Safety Professionals 3-0-3
(The syllabus for this course should indicate the difference between this graduate level course and the corresponding undergraduate course BC 4610).
- BCP 6950: Occupational Safety and Health Capstone 3-0-3
(There was discussion about expanding course from an 8-week model to a 12-week to give adequate time between progress reports so students can appropriately act on feedback.)

All courses were tabled by the committee. It was noted that the syllabi should reference specifically how the courses are distinguished at a higher level than the undergraduate versions if the course is referencing a corresponding undergraduate course.

All syllabi should include a revised Office of Disability Services statement (formerly ADAPTS) and all NCP's should be updated to include a course title if a course is using a Special Topics (8803) course as a pre-requisite.

- BCP 8803: Special Topics (Fundamentals of Occupational Safety and Health Program Management)
- BCP 8813: Special Topics (Industrial Hygiene Principles and Health Hazards)
- BCP 8823: Special Topics (Hazardous Materials Management)
- BCP 8833: Special Topics (General Industry Occupational Safety and Health)
- BCP 8843: Special Topics (Advanced Safety Principles)
- BCP 8853: Special Topics (Applied Ergonomics)

The Committee requested a general blueprint of all courses (the courses requesting permanent numbers and the Special Topics courses) being presented to support the PMOSH degree and how an 8-week 3 credit hour course will be structured, specifically, how the coursework will translate from face-to-face classroom instruction to on-line instruction.

4. A motion was made to *approve* a request from the Schools of Civil and Environmental Engineering, Biology, and Earth and Atmospheric Sciences for a new degree. This motion was seconded and approved.

New Degree - APPROVED

DR-OSE

We propose a new **PhD Program in Ocean Science & Engineering (OSE)** that will integrate, coordinate and expand the on-going efforts in ocean science & engineering at GT across the Schools of **Earth & Atmospheric Sciences (EAS), Civil and Environmental Engineering (CEE), and Biology (BIOL)**. OSE will contribute new avenues for collaboration between institutions within the University System of Georgia (USG) and beyond, and train the next generation of leaders to solve the complex challenges facing ocean & humans today.

The new program in Ocean Science and Engineering will enhance existing strengths in ocean-related science and engineering across the Colleges of Sciences and Engineering to advance fundamental research and problem solving and to educate the next generation of ocean experts, in five key areas:

- Ocean Technology
- Ocean Sustainability
- Ocean & Climate
- Marine Living Resources
- Coastal Ocean Systems

Curriculum

The PhD Program in Ocean Science & Engineering (OSE) is designed to integrate, coordinate and expand the on-going efforts in ocean science & engineering at GT, while contributing new avenues for collaboration between institutions within the University System of Georgia (USG), and training the next generation of leaders to solve the complex challenges facing the ocean today. Such training is organized around five themes:

OSE Research Themes

- Ocean Technology
- Ocean Sustainability
- Ocean & Climate
- Marine Living Resources
- Coastal Ocean Systems

The PhD in OSE is designed to be completed over 4.5 – 6 years (fall, spring and summer), with an expected duration of 5 years, with a total of 32-credit hours required for each student. **The program will not grant undergraduate or master degrees.**

The program includes the 2 Schools within the College of Sciences: Biology (BIOL) and Earth and Atmospheric Sciences (EAS), and 1 School within the College of Engineering (Civil and Environmental Engineering (CEE). Faculty from these schools provide distinct and complementary expertise leveraged by the OSE PhD, both in terms of coursework and research specialization. Additional program faculty include members of CoS and CoE. Interdisciplinary cooperation and input is ensured by the diversity of faculty in the program. Key to this cooperation is the establishment of a founding program graduate committee comprised of 6 faculty members, representing the 3 Schools within CoS and CoE.

The program is designed to provide much flexibility in order to allow students to tailor the program to their individual career objectives under the **Research Themes of OSE** (e.g. Ocean Sustainability, Ocean Technology, Ocean & Climate, Marine Living Resources, Coastal Ocean Systems).

General Coursework Requirements

The PhD degree in OSE requires a minimum of 32 semester hours of coursework to cover the core topics articulated in the essential knowledge list (EKL). As mentioned already, the course load requirement could be partially lifted for students with proven foundations in any of the research areas (i.e. students with a Master degree). The coursework includes in its core component the OSE seminar offered to incoming students in their first Spring semester. The OSE seminar will serve the dual role of introducing OSE students to research advances in the laboratories and groups of participating program faculty as well as providing a point of contact for matching students and faculty aiding the formation of the Advising Committees.

The general requirements for a PhD in Ocean Science and Engineering include:

Component	Courses	Hours Required
	The OSE PhD program requires completion of four 3-hour credit courses between the ones listed below. Student must choose at least one core topic and one class from each school.	

<p>OSE Core Courses</p>	<p>Core topics for EKL, at least one from each School + one additional course:</p> <p>CEE TOPIC: Coastal & Ocean Mechanics Environmental Fluid Mechanics (CEE 6261) (Fall, yearly) Coastal Mechanics (CEE 8803) (Fall, yearly)</p> <p>TOPIC: Environmental Biotechnology Microbial Principles in Environmental Engineering (CEE 6311) (Fall, yearly) Biological Processes (CEE 6331) (Spring, yearly) Environmental Microbial Genomics (CEE 6720) (Spring, yearly)</p> <p>BIO TOPIC: Marine Ecology & Conservation Marine Ecology (BIOL 6417) (Spring, odd years) Biological Oceanography (BIOL 6221) (Spring, even years)</p> <p>TOPIC: Biological & Microbial Oceanography Microbial Ecology (BIOL 6410) (Spring, even years) Biological Oceanography (BIOL 6221) (Spring, odd years)</p> <p>EAS TOPIC: Physical and Chemical Oceanography Physical and Chemical Oceanography (EAS 6305) (Fall, yearly) Global Biogeochemical Cycles (EAS 6122) (Spring, even years) Advanced Environmental Data Analysis (EAS 6490) (Fall, yearly)</p> <p>TOPIC: Ocean & Climate Thermodynamics of Atmospheres & Oceans (EAS 6140) (Fall, yearly) Climate and Global Change (EAS 4410/8803) (Fall, yearly)</p> <p>Ethics/RCR training - pass/fail ohr OSE Seminar - 2hr (EAS 8802) (Spring, Yearly)</p>	<p>14</p>
<p>OSE</p>	<p>Elective courses that increase depth of understanding in</p>	<p>9</p>

Specialization	the research Theme chosen by the PhD candidate (<i>e.g. Ocean Sustainability, Ocean Technology, Ocean & Climate, Marine Living Resources, or Coastal Ocean Systems</i>)	
Minor	Courses outside the student' selected Themes (equivalent to Institute approved minor)	9
	TOTAL	32

Students can request to modify one of the classes associated with the core topics pending approval by their PhD Advising Committee. The requirement of at least one course from each School cannot be altered.

Curriculum Standards

Ocean Science and Engineering is a relatively new area of interdisciplinary science. Hence, there is not a nationally accredited society or organization responsible for setting curriculum standards. Nonetheless, OSE @ GT leverages existing PhD programs in traditional disciplinary Schools. The majority of the courses are already offered at GT, and reviewed as part of regular reviews of the doctoral programs in each of the three Schools.

Notes from the Discussion: The Committee was advised that suggested revisions had been added to the proposal since the last Curriculum Committee meeting (see December 3, 2015 meeting minutes re: TOEFL score and internship requirements).

The Committee noted that the required minimum 3.2 GPA that must be maintained throughout the student's duration in the program should be clearly stated as such in the proposal.

Update: Dr. Di Lorenzo submitted an updated version of the proposal to the Graduate Curriculum Committee website on Friday January 16, 2016.

5. A motion was made to *approve* a request from the School of Earth and Atmospheric Sciences. This motion was seconded and approved.

New Courses – APPROVED upon contingency (see notes from the discussion below)

EAS 6131: Ocean Modeling	3-0-3
EAS 6133: Marine Ecosystem Modeling	3-0-3

EAS 6155: Math Geophysical Fluid Dynamics 3-0-3
(The Committee suggested to edit the course/transcript title to 'Advanced Geophysical Fluid Dynamics'/'ADV GEOPHYS FLUID DYNAM')
EAS 6672: Ocean Dynamics 3-0-3

Notes from the Discussion: The Committee noted that learning outcomes should be added to all syllabi for these courses. Also, all grade modes (box #6) should be checked and the Planned Frequency of Offering (box #12) should reflect the accurate offerings of the courses.

Update: The NCPs and syllabi for all of the above courses have been updated and uploaded to the GCC site as of January 21, 2016.

Adjourned,

Reta Pikowsky,
Secretary