Graduate Council Curriculum Subcommittee
February 21, 2007
12:00, MH 243

1. Approval of Minutes from 2-14-2007
2. Review tabled materials/supplies fees and equipment fees
3. Initial Teacher Prep Grad Certificate – Dr. Muthoni Musangali, Ed Studies
4. Science Education track – Dr. Bobby Jeanpierre, Teaching & Learning Principles
5. Course changes to the MS-Env Engr and MS-Env Engr Sciences – Dr. David Cooper, Civil & Envr Engineering
6. Course changes to the Transportation Systems Engr track – David Cooper
7. Inactivation of Graduate Certificate in Wastewater Treatment – David Cooper
8. Courses and special topics

University of Central Florida

Office of Student Services

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MEMORANDUM

November 16, 2006

TO: **Dr. Patricia Bishop, Vice Provost and Dean, Graduate Studies**

FROM: **Dr. Grant Hayes, Associate Dean of Graduate Studies, College of Education**

SUBJECT: Track Addition Proposal to the PhD in Education

Attached please find a proposal to add a new track—Science Education—to the PhD in Education. This track proposal was reviewed and approved at the College of Education Graduate and Curriculum Standards Committee meeting held Tuesday, November 14, 2006.

College of Education
P.O. Box 161250 • Orlando, FL 32816-1250 • (407) 823-3723 • FAX: (407) 823-3852

Science Education Track- 51 Credit Hours Minimum

This track is designed to prepare science educators for successful careers in research and teaching. The program will assist students in providing options to careers in preparing teachers of science, teaching postsecondary science, and conducting research in science education. Doctoral students in this track engage in research activities with an interdisciplinary faculty, experience internships, and interact with the nationally acclaimed Lockheed Martin/UCF Academy for Mathematics and Science. Throughout theses activities, students are also mentored by experienced and successful university science education faculty.

- SCE 7XXX Teaching Theory and Research in Science Education (3 credit hours)
- SCE 7XXX Design of Postsecondary Science Curriculum (3 credit hours)
- SCE 7XXX Assessment in Science Teaching and Learning (3 credit hours)
- SCE 7XXX Science, Technology & Society (3credit hours)
- SCE 7XXX Special Seminar Professional Writing/Grant Writing in Science Education (3 credit hours)
- SCE 7XXX Professional Issues in Science Education (3 Credit hours)
- SCE 7XXX Internship/Practicum in Science Education (K-12 or community college((6 credit hours)
- Additional Electives: (3 hours)
- Cognate Courses in Science (24 credits) *****Course must be approved by advisor

Core Courses-24 Credit Hours

- IDS 7501 Issues and Research in Education (3 credit hours
- IDS 7938 Research Cluster Seminar (3 credit hours)
- IDS 7500 Seminar in Educational Research (variable credit and repeatable, 6 credit hours)
- EDF 7475 Qualitative Research in Education (3credit hours)
- EDF 7403 Quantitative Foundations of Educational Research (3 credit hours)
- EDF 7463 Analysis of Survey, Record and Other Qualitative Data (3 credit hours)
- IDS 7502 Case Studies in Research Design (3 credit hours)

Dissertation- 24 Credit Hours Minimum

Doctoral students must present a prospectus for the dissertation to the doctoral adviser, prepare a proposal and present it to the dissertation committee, and defend the final research submission with the dissertation committee.

Candidacy

To enter candidacy for the Ph.D., students must have an overall 3.0 grade point average on all graduate work included in the planned program and pass all required examinations.

Candidacy Examinations

- Examination must be completed prior to admission to candidacy.
- Examinations will be scheduled by the student and major adviser. The associate dean for graduate studies and research must be notified of the date and location of the exam 30 days in advance
- All Ph.D. candidates will be required to complete two examinations. Students must be enrolled in the university during the semester and examination is taken
- Research in the Specialization- 8 hour written examination
- Specialization- 3 hours oral examination

Ph.D. in Education
Science Education Track

Proposed Program: **(New Program Track)**	**Ph.D. in Education** **Science Education**
Program Level:	**Doctoral**
Proposed Implementation Date:	**Fall Semester, 2007**

Other Programs in the State of Florida

The University of Central Florida is the ***only*** major research university in the state of Florida ***without*** a Ph.D. program (track) or equivalent in Science Education. FSU, UF, USF and FIU all have doctoral programs in science education. In addition to the previously mentioned universities, the University of Miami also has a doctoral (Ph.D.) program in Science Education. Upon examination of the curricula provided at the website of each of these institutions, none specifically list a course on *assessment* of science teaching and learning. As science educators, we believe the area of *assessment in science* education is taking on greater importance in K-16 setting, particularly in Florida. And we perceive that this trend will continue. Hence, it is important that doctoral programs explicitly address the area of science assessment in its program courses, which we have done. Also, the proposed course of study presented for this Ph.D. in Science education is strong in all areas integral to a comprehensive science education program: curriculum, research, and assessment. The combination of topics proposed for this program are rigorous and will prepare a robust group of professionals who are capable of addressing the complex issues in science education as they relate to curriculum, teaching and research.

Other Programs which can be used as Models (please list)

Florida State University, University of Florida, University of South Florida and Florida International University all have many common courses across programs. We have included similar course (such curriculum design in science education, history and philosophy of science, and core research courses). As previously mentioned this proposed science education track will emphasize ***research in science education*** and explicitly address ***assessment*** in science education, which is not evident in other programs examined throughout the state.

Articulation and Conceptualization of the Proposed Program

The purpose of this program is to prepare doctoral-level personnel to meet the critical nationwide shortage in science education for work in the professorate. In particular, this program will prepare faculty with in depth course work and experiences in research in science education teaching, learning and assessment. In the recent publication, *"Rising Above the Gathering Storm"*, from the National Academy of Sciences, it stated: "Having reviewed trends in the United States and abroad, the committee is deeply concerned that the scientific and technical building blocks of our economic leadership are eroding at a time when many other nations are gathering strength" (p.4). From this report numerous legislation has already been passed to effect then number of students (k-16) entering the science disciplines. Key to developing this expected talent pool of new scientists and engineers is the development of a strong science education work force at all levels of education.

The doctoral students prepared through this program will have the knowledge, skills, and experiences to meet the challenge of educating the next generation of science teachers (K-16), who would affect the production of the next generation of needed scientists and engineers.

Doctoral students in this program will have the opportunity to develop research skills in science education through course work assignments and participation on science, mathematics and technology related research projects. The research opportunities provided to students will promote the development of skills in both the quantitative and qualitative methodologies. The State of Florida has sent out a RFP for the anticipated funding of a Science Research Center. The prospect of getting a science research center in the state opens up a multitude of research possibilities for graduate students. The science and mathematic faculty here at UCF will put forth a proposal for this exciting initiative. Of course, if we were to obtain this science research center, the possibilities for research would grow exponentially for prospective science education students here at the University of Central Florida.

Curriculum Overview:

The program of study is interdisciplinary in nature. We have garnered support of colleagues in the College of Science and from several colleagues of the various departments in the College of Education. The program is open to all qualified candidates, and it will parallel other Ph.D. Tracks in Education (Minimum hours required =99 credit hours).

Core Courses: 24 hours (issues and research in education, research methods, seminar in educational research, qualitative research in education, quantitative foundations of educational research, analysis of survey, record and other qualitative data, case studies in research design)

Specialization Coursework: 51hours (science education and cognate)

Internship: 6 hours

Dissertation: 24 credit hours. Doctoral students must present a prospectus for the dissertation to a doctoral advisor, prepare a research proposal and present to the dissertation committee, and defend the final research submission with the dissertation committee.

Student Demand

The anticipated number of students for the first year of the program ranges from 2-4. But as the program become more visible through outreach and networking at state, national, and international conferences, the number is likely to increase.

Identification of Program Demand

Currently, in science education in higher education there is a demand for science education faculty, particularly, those who have a strong research background. Just like the scientific workforce outside of academia, many of the higher education science faculty is nearing retirement. Many of the current science education faculty started teaching at the university level during the late 1960s and 1970s and they are retiring across the country. Graduates in STEM (Science, Technology, Engineering and Mathematics) field historically are in demand and have a number of employment opportunities at the university level, K-12 level and other fields of science and mathematics, as well.

Relationship to University mission and strategic directions, local economic development and community need.

As stated previously, **"***Rising Above the Gathering Storm"* has served to re-emphasize the need to sustain a competent, highly qualified STEM workforce. Additionally, Orlando and the University of Central Florida are positioned in a prime high technology corridor of the state and President Hitt's vision is that the University of Central Florida will become the number one metropolitan research university in the country. The focus of this program to produce science educators with strong backgrounds in science education research aligns with this vision. Our graduates will be able to take their place in the state and throughout the country and meet the need of educating the next STEM generation and producing important research findings on science education at all levels.

Current Science Education Faculty:

Currently, in the College of Education there are four science education faculty members: Dr. Robert Everett, Dr. Bobby Jeanpierre, Dr. Mary Romjue and Dr. Aldrin Sweeney. Three of the faculty members are at the associate level and one at the assistant professor level.

College of Sciences Faculty

Dr. Daniel Britt- Astronomy/physics
Dr. Peter Delfyette- Optics/physics
Dr. Michael Hampton- Chemistry
Dr. Allison Morrison-Shetlar- Faculty Center for Teaching and Learning and biology
Dr. Robert Shetlar- Biology

College of Education Faculty-Research
Department of Educational Research, Technology and Leadership

Bai, Haiyan
Blasi, Laura
Hahs-Vaughn, Debbie
Sivo, Steven
Wallace, Tary
Witta, Eleanor Lea

College of Education
Department of Child, Family, and Community Sciences

Robinson, Edward (Mike)

College of Education
Department of Educational Studies

Dr. David Boote

*** There maybe additional faculty not listed who currently teach courses appropriate for this Ph.D. in Science Education Track.**

Memorandum

Date: January 31, 2007
From: Dr. C. David Cooper
To: Graduate Council
Subject: Change of MS-Env Engr and MS-Env Engr Sciences Program of Study

The department of Civil and Environmental Engineering offers the MSVE degree (Master's in Env Engineering) and the MS (Master of Science-Env Engr Sciences). In the past, for many years, both programs track required that one of three specific water resources be taken as part of the degree program. However, as the number of offerings by the Water Resources faculty have increased, it became obvious that it would be better to give the students a wider variety of choice in the CWR area.

Therefore, the CEE Department hereby requests that we change the portion of these programs dealing with the CWR courses as follows:

Old wording:

- CWR 5545 Water Resources Engineering (3 credit hours) or CWR 5125 Groundwater Hydrology (3 credit hours) or CWR 6235 Open Channel Hydraulics (3 credit hours)

New wording:

- Any CWR course at the 5XXX or 6XXX level (3 credit hours)

Thank you for your consideration.

C. David Cooper
Professor and Graduate Coordinator

CURRENT CATALOG 2006-2007

MASTER OF SCIENCE IN ENVIRONMENTAL ENGINEERING

The Master of Science in Environmental Engineering (M.S.Env.E.) degree requires either (a) 30 credit hours of acceptable graduate work, which includes a thesis (6 credit hours), or (b) 30 credit hours of acceptable graduate work, and a comprehensive final examination. The student develops an individualized program of study with a faculty adviser.

General College Requirements

Minimum Hours Required for M.S.Env.E.—30 Credit Hours

Prerequisites for all students:

- Calculus through Differential Equations

Prerequisites for students with engineering undergraduate degrees in Civil, Environmental, Mechanical, Chemical Engineering (note: equivalent courses may be acceptable):

- CWR 4101C Hydrology (3 credit hours)
- EES 4111C Biological Process Control (3 credit hours)
- EES 4202C Chemical Process Control (3 credit hours)
- ENV 4120 Air Pollution Control (3 credit hours)
- ENV 4561 Environmental Engineering—Process Design (4 credit hours)

Prerequisites for students with undergraduate degrees in other Engineering disciplines:

- ENV 3001 Introduction to Environmental Engineering (3 credit hours)
- CWR 4101C Hydrology (3 credit hours)
- CWR 4203C Hydraulics (3 credit hours)
- EES 4111C Biological Process Control (3 credit hours)
- EES 4202C Chemical Process Control (3 credit hours)
- ENV 4120 Air Pollution Control (3 credit hours)
- ENV 4561 Environmental Engineering—Process Design (4 credit hours)

Prerequisites for students with appropriate Science or Math undergraduate degrees:

- ENV 3001 Introduction to Environmental Engineering (3 credit hours)
- CWR 3201 Engineering Fluid Mechanics (3 credit hours)
- CWR 4101C Hydrology (3 credit hours)

- CWR 4203C Hydraulics (3 credit hours)
- EES 4111C Biological Process Control (3 credit hours)
- EES 4202C Chemical Process Control (3 credit hours)
- EGN 3613 Engineering Economic Analysis (2 credit hours)
- ENV 4120 Air Pollution Control (3 credit hours)
- ENV 4561 Environmental Engineering—Process Design (4 credit hours)

Required Courses—15 Credit Hours

- CWR 5545 Water Resources Engineering (3 credit hours) or CWR 5125 Groundwater Hydrology (3 credit hours) or CWR 6235 Open Channel Hydraulics (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)
- 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 credit hours (for thesis option) or 15 credit hours (for nonthesis option)

Courses that comprise the elective part of the program are selected in accordance with the general requirements of the College of Engineering and Computer Science and often include courses taken from the following two sub-discipline areas:

- Environmental Specialization—Any of the appropriate ENV graduate-level courses (5000 or 6000) with the consent of the student's adviser
- Water Resources Specialization—Any of the appropriate CWR graduate-level courses (5000 or 6000) with the consent of the student's adviser

Thesis—6 Credit Hours

Master of Science - Environmental Engineering

Environmental Sciences Track

Minimum Hours Required for M.S.—30 (Thesis Option) or 30 (Nonthesis Option) Credit Hours

The Master of Science - Environmental Engineering Sciences (M.S.) degree requires (a) 30 semester hours of acceptable graduate work, which includes a thesis (6 semester hours), or (b) 30 semester hours of acceptable graduate work with a comprehensive final examination. The student develops an individualized program of study with a faculty adviser.

General College Requirements

Prerequisites for all students:

- Calculus through Differential Equations

Prerequisites for students with engineering undergraduate degrees in Civil, Environmental, Mechanical, Chemical Engineering (equivalent courses may be acceptable):

- CWR 4101C Hydrology (3 credit hours)
- EES 4111C Biological Process Control (3 credit hours)
- EES 4202C Chemical Process Control (3 credit hours)
- ENV 4120 Air Pollution Control (3 credit hours)
- ENV 4561 Environmental Engineering—Process Design (4 credit hours)

Prerequisites for students with undergraduate degrees in other Engineering disciplines:

- ENV 3001 Introduction to Environmental Engineering (3 credit hours)
- CWR 4101C Hydrology (3 credit hours)
- CWR 4203C Hydraulics (3 credit hours)
- EES 4111C Biological Process Control (3 credit hours)
- EES 4202C Chemical Process Control (3 credit hours)
- ENV 4120 Air Pollution Control (3 credit hours)
- ENV 4561 Environmental Engineering—Process Design (4 credit hours)
- Or equivalent courses

Prerequisites for students with appropriate Science or Math undergraduate degrees:

- ENV 3001 Introduction to Environmental Engineering (3 credit hours)
- CWR 3201 Engineering Fluid Mechanics (3 credit hours)
- CWR 4101C Hydrology (3 credit hours)
- CWR 4203C Hydraulics (3 credit hours)
- EES 4111C Biological Process Control (3 credit hours)
- EES 4202C Chemical Process Control (3 credit hours)
- EGN 3613 Engineering Economic Analysis (2 credit hours)
- ENV 4120 Air Pollution Control (3 credit hours)
- ENV 4561 Environmental Engineering—Process Design (4 credit hours)
- Or equivalent courses

Required Courses—12 Credit Hours

- CWR 5545 Water Resources Engineering (3 credit hours) or CWR 5125 Groundwater Hydrology (3 credit hours) or CWR 6235 Open Channel Hydraulics (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)

Elective Courses—12 credit hours (for thesis option) or 18 credit hours (for nonthesis option)

- Any of the appropriate ENV or CWR or appropriate graduate-level courses (5000 or 6000) with the consent of the student's adviser (3 credit hours each)

Thesis—6 Credit Hours

Memorandum

Date: January 31, 2007
From: Dr. C. David Cooper
To: Graduate Council
Subject: Change of MSTS required courses in Program of Study

The department of Civil and Environmental Engineering offers the MS degree in several tracks. One such track is the MS in Transportations Systems Engineering (MSTS). In the past, for many years, the track required 4 specific courses to be taken. However, as the number of offerings by the Transportation faculty have increased, it became obvious that it would be better to give the students a wider variety of choice.

Therefore, the CEE Department hereby requests that we change the MSTS program to read as follows:

Required Courses—(5 Courses for 15 Credit Hours)

Students make take five of the following courses:

- TTE 5204 Traffic Engineering (3 credit hours)
- TTE 5205 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 (3 credit hours)

Elective Courses (Choose one option)

Thesis students must take three (3) more courses which must be approved by their adviser, and do a thesis. Non-thesis students must take five (5) more courses which must be approved by their advisor.

Thank you for your consideration.

C. David Cooper
Professor and Graduate Coordinator

CURRENT CATALOG 2006-2007

Transportation Systems Engineering Track

Prerequisites

- STA 3032 Probability and Statistics for Engineers (3 credit hours)
- TTE 4004 Transportation Engineering (3 credit hours)

I. Thesis Option:

Course work—24 Credit Hours (8 courses), Thesis—6 Credit Hours

Required Courses—(5 Courses for 15 Credit Hours)

Students make take five of the following courses:

- TTE 5204 Traffic Engineering (3 credit hours)
- TTE 5205 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 (3 credit hours)

Elective Courses (Choose one option)

Students must take three more course which must be approved by their adviser.

II. Non-Thesis Option:

Course work—30 Credit Hours (10 courses), Comprehensive Exam

Required Courses—(5 Courses for 15 Credit Hours)

Students make take five of the following courses:

- TTE 5204 Traffic Engineering (3 credit hours)
- TTE 5205 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 (3 credit hours)

Elective Courses (5 Courses for 15 Credit Hours)

Students must take five additional courses. The electives should come preferably from the above list, but may include other courses with advisers consent.

Memorandum

Date: January 29, 2007
From: Dr. C. David Cooper
To: Graduate Council
Subject: Removal of Graduate Certificate in Wastewater Treatment

The department of Civil and Environmental Engineering has several Certificate programs, some of which are reasonably well populated and others of which are not. The Wastewater Treatment Certificate is one which has no students currently, and which is not likely to attract many in the future. One problem is that the courses are all graduate level Environmental Engineering courses, and cannot be taken unless the student has had appropriate undergraduate engineering courses. Just last week I received a call from a person who said she wanted to get into that program, but after talking with her, I found out that she had misunderstood the description in the catalog. She had a business degree, and wanted some simplified short-course-type "certification."

When I told her that she would need to take a number of pre-requisite engineering courses, she was disappointed, and said we had a false or misleading advertisement of the program in our catalog. (After reading the catalog, I concluded that the description is correct as worded, but is not clear about the pre-requisites.) Nevertheless, we do not get many customers in this particular Certificate program, and the program is not serving our needs nor the needs of the public. Therefore, the CEE Department hereby requests that we discontinue the Wastewater Treatment Certificate program, effective May, 2007, and that we remove that program from the catalog.

Thank you for your consideration.

C. David Cooper
Professor and Graduate Coordinator

Graduate Certificate In Wastewater Treatment

Description

Continued population growth in the central Florida area is causing a strain on our wastewater facilities. More experienced professionals are needed to handle this growing concern. This graduate certificate program offers courses to help professionals update their knowledge of research and practice in the area of wastewater treatment.

Admission

Admission is open to those with a bachelor's degree from a regionally accredited institution. Students must have had an undergraduate course on water/wastewater treatment (such as ENV 4561) or equivalent. An application to the graduate certificate program and official transcripts must be submitted. Applicants must apply online.

Application Due Dates

U.S. Applicants

Program(s)	Fall Priority	Fall	Spring	Summer
Graduate Certificate in Wastewater Treatment		Jul 15	Dec 1	Apr 15

Requirements

Required Courses—12 Credit Hours Minimum

- ENV 6016 Biological Treatment Systems in Environmental Engineering (3 credit hours)

And choose three courses from the following:

- ENV 5505 Sludge Management Operations in Environmental Engineering (offered every other year) (3 credit hours)
- ENV 6015 Physical/Chemical Treatment Systems in Environmental Engineering (3 credit hours)
- ENV 6519 Aquatic Chemical Processes (offered every other year) (3 credit hours)
- ENV 6558 Industrial Waste Treatment (3 credit hours)

Contact Info

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