Contact Name: Annalisa Calini  
Email: calinia@cofe.edu  
Phone: 3-5732

Department Name: Mathematics  
Graduate Program name: Mathematics

Course Prefix, Number, and Title: MATH 690: Graduate Teaching Seminar

I. CATEGORY OF REVIEW (Check all that apply)

NEW COURSE  
(attach syllabus*)

CHANGE COURSE

DELETE COURSE

-----(Complete all sections below that apply including those indicated)------

☐ New Course
☐ Change Number (IV, VII, VIII, IX)
☐ Change Title (IV, VII, VIII, IX)
☐ Change Credits/Contact hours (II, IV, VII, IX)
☐ Prerequisite Change (IV, VII, VIII, IX)
☐ Edit Description (III, IV, VII, VIII, IX)

☐ Approve for Cross-listing (attach Graduate Permission to Cross-list Form)

Date (Semester/Year) the course will first be offered, course changes or deletion will go into effect:

Fall 2015

NEW COURSE:

*ATTACH THE SYLLABUS FOR A NEW GRADUATE COURSE to include: (See Attached)

- Course description and objectives
- Method of teaching (e.g., lecture, seminar, on-line, hybrid)
- Required and optional texts and materials
- Graduate School Grading Scale
- Assignments, student learning outcomes and assessment components
- Policies to include attendance, Honor Code, American Disabilities Act statement
- Tentative course schedule with specific topics
IX. APPROVAL AND SIGNATURES

Signature of Program Director: ___________________________ Date: 11/12/2014

Signature of Department Chair: ___________________________ Date: 11/12/2014

Signature of Additional Chair*: ___________________________ Date: ________________

Signature of Schools’ Dean: ___________________________ Date: 11/21/2014

Signature of Additional Schools’ Dean*: ___________________________ Date: ________________

Signature of the Provost: ___________________________ Date: 12/22/14

Signature of Budget Director/Business Affairs Office: ___________________________ Date: ________________

*For interdisciplinary courses

Return form to the Graduate School Office for Further Processing

Signature of Chair of the Faculty Committee on Graduate Education, Continuing Education & Special Programs: ___________________________ Date: 1/23/2015

Signature of Chair of the Graduate Council: ___________________________ Date: ________________

Signature of Faculty Senate Secretary: ___________________________ Date: ________________

Date Approved by Faculty Senate: ___________________________
List prerequisites and / or other restrictions below

Prerequisites: Admission to the Mathematics Graduate Program.

Restrictions: This course will not count toward the 30-credit-hour requirement for the Master of Science in Mathematics degree.

Will this course be added to the Degree Requirements?

a) ☐ Yes  ☐ No X

b) If yes, explain

II. NUMBER OF CREDITS and CONTACT HOURS per week

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Lab</th>
<th>Seminar</th>
<th>Ind. Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Contact Hours</td>
<td></td>
<td></td>
<td>1-3 (Seminar)</td>
<td></td>
</tr>
</tbody>
</table>

B. Credit Hours  1-3 hours

Is this course repeatable? X ☐ yes  ☐ no  If so, how many credit hours may the student earn in this course?

Up to three hours.

III. CATALOG DESCRIPTION Limit to 50 words EXACTLY as you want it to appear in the catalog: include prerequisites, co-requisites, and other restrictions. If changing course description, please include both old and new course descriptions.

This seminar is designed for graduate students in the mathematical sciences who are interested in teaching in higher-education settings. The seminar is customizable with a range of activities addressing practical and theoretical aspects of teaching and learning: from constructing and teaching a class, including syllabus preparation and time management, to learning effective approaches to college-level teaching. Students will have the opportunity to work closely with a faculty member in an undergraduate classroom environment.

Restrictions: This seminar does not count toward the 30-credit-hour requirement for the MS in Mathematics.
IV. RATIONALE / JUSTIFICATION: If course change – please indicate the course change details. If course change or deletion—please provide reasons for change(s) to or deletion of a course. If a new course—briefly address the goals/objectives for the course and the relationship to the strategic plan.

Many students in the Mathematics graduate program aspire to teach in the higher education setting, and a number of our students are high school teachers or are involved in teaching activities at various levels. The main goal of this seminar course is to help students become more informed and competent teachers, equipped for success in the undergraduate classroom. The objectives of the seminar include: 1. learning effective teaching strategies, best practices, and successful use of teaching technology tools for college-level mathematics and statistics; 2. learning the supporting pedagogical research; 3. designing appropriate teaching materials, including lessons, activities, assignments, and assessments; 4. practice teaching and experimenting with a variety of teaching methods.

The Graduate Teaching Seminar would be an integral component of the Department of Mathematics training and supervision of graduate students who teach in our courses.

Relationship to the Strategic Plan: The proposed new seminar course will be a distinctive feature of the Mathematics Graduate Program, as it will provide students preparing for careers in higher education with an unusual opportunity to receive structured mentoring and training in teaching at an institution with a strong focus on undergraduate education. This course also responds to the increasing regional need for well-prepared mathematics and statistics educators at the 2- and 4-year college level.

V. STUDENT LEARNING OUTCOMES and ASSESSMENT

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students</td>
</tr>
<tr>
<td>1. Students demonstrate an understanding of effective pedagogical methods and best</td>
<td>be able to do on the assessment?</td>
</tr>
<tr>
<td>practices in teaching lower-division mathematics and statistics courses.</td>
<td>Students participate in seminars and discussion sessions on pedagogy and develop an annotated bibliography</td>
</tr>
<tr>
<td></td>
<td>of relevant reading materials. Students write essays summarizing current research on teaching and learning</td>
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<td></td>
<td>and/or describing their own approach to a specific aspect of teaching. Assessment takes place periodically</td>
</tr>
<tr>
<td></td>
<td>throughout the semester (graded essays, summaries, participation.)</td>
</tr>
</tbody>
</table>
2. Students demonstrate an understanding of content knowledge in lower level mathematics and statistics courses.

3. Students display confidence and professionalism in delivering mathematics and statistics materials designed for a student audience (including lower division class materials classes, group recitations, and help sessions).

4. Students develop, reflect upon, and refine their own teaching philosophies.

<table>
<thead>
<tr>
<th>How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduates of the program will be expected to find suitable employment in industry, K-12 education, post-secondary education, or will continue to graduate study.</td>
</tr>
</tbody>
</table>

Students design, develop, and edit course documents. These include teaching-specific documents (such as sample tests, quizzes, and homework assignments) and course-specific documents (such as a sample syllabus). Assessment is ongoing (with deadlines for multiple drafts and final products.) The quality of the materials produced must be comparable to that expected of the mathematics department teaching faculty.

Assignments such as mock presentations, video-recorded mini-lessons, discussion of technology, and tips for board use make students feel comfortable in their delivery of the material. Each student’s confidence in their own presentation style will be surveyed at the beginning and end of the course.

The transformation in each individual’s philosophy becomes apparent through a comparison of the student’s original teaching philosophy (written during Week 1) with his or her final teaching philosophy (submitted during Week 14).

VII. IMPACT ON EXISTING PROGRAMS and COURSES: Please briefly document the impact and expected changes of this new/changed/deleted course on other departments, programs and courses; if deleting a course—list all departments and programs that include the course; if adding/changing a course—explain any overlap with existing courses in the same or different departments; if adding or deleting a course that will be part of a joint program identify the partner institution.

None. This course will not count towards any degree requirement. There are no other courses at the College on teaching and learning related to lower-division college-level mathematics and statistics.
VIII. COSTS ASSOCIATED WITH THE ACTION REQUESTED: List all of the new costs or cost savings, (including new faculty/staff requests, library or equipment, etc.) associated with the action requested. New courses requiring additional resources will need special justification.

The seminar will be taught by existing Mathematics faculty members. New costs would be one three-credit-hour adjunct replacement (the seminar will be offered once a year), and a one-time summer grant for course development.
University of Charleston, SC  
MATH 690: Graduate Teaching Seminar  

Sample Syllabus

Course Description: This seminar is designed for graduate students in the mathematical sciences who are interested in teaching in higher-education settings. The seminar is customizable with a range of activities addressing practical and theoretical aspects of teaching and learning: from constructing and teaching a class, including syllabus preparation and time management, to learning effective approaches to college-level teaching. Students will have the opportunity to work closely with a faculty member in an undergraduate classroom environment. Credit-hours earned in this seminar do not count toward the degree requirements for the Master of Science in Mathematics.

Course Objectives: This seminar course will discuss effective teaching strategies, best practices, and successful use of teaching technology tools for college-level mathematics and statistics, as well as the pedagogical research that supports them. Students will put what they learn into practice by designing lessons and assignments, teaching a class, and experimenting with a variety of teaching methods. Students who complete the course will be more informed and confident teachers, equipped for greater success in the undergraduate classroom.

Organization and Expectations: MATH 690 is a customizable 1-3 credit-hour seminar course based on a series of modules covering a variety of activities. Satisfactory completion of all activities in the list of Basic-Level Activities is required to earn one credit-hour. Up to two additional credit hours can be earned by completing an agreed selection of Advanced-Level Activities. Students pursuing the 3 credit-hour option are required to submit a Teaching Portfolio incorporating a well-articulated teaching philosophy and a coherent set of teaching materials. The weekly meetings will include discussion sessions on pedagogy, training seminars, and workshops, and group work.

Basic-Level Activities:

1. Write a teaching philosophy.
2. Observe a faculty member teach a 50-minute or 75-minute 100-level courses, at least twice.
3. Observe a faculty member teach a 50-minute or 75-minute 200-level course, at least twice.
4. Design an assignment or project for a 100-level course.
5. Create an exam for a 100-level course.
6. Design a syllabus for a 100-level course.
7. Construct an in-class activity for a 100-level course.
8. Give a 15-minute presentation in a MATH course.
9. Attend the Math Lab Tutor training sessions.
10. Volunteer in Math Tutoring Lab for three one-hour sessions.
11. Attend three teaching-related seminars---organized by the Mathematics department or by the Teaching, Learning and Technology (TLT) department---, and write reports.
12. Attend one TLT training session.
13. Keep an annotated bibliography of all the articles and books you read related to teaching, teaching in your field, uses of technology, etc.

Advanced-Level Activities:

1. Give a 50-minute lecture in a Mathematics course.
2. Serve as a grader for a semester.
3. Serve as Supplemental Instructor (SI) for a semester. (This includes completing the semester-long SI Training: a 2-day session at the beginning of the semester and bi-weekly meetings.)
4. As an SI leader for a course, develop a packet of materials that can be used for supplemental instruction in future offerings of such course.
5. Write an essay on how to build community in the classroom for a specific-sized class.
6. Write a set of activities, including group-based and individual activities, on a chosen 100-level mathematics or statistics topics.
7. Create online content, such as screencasts or mini-lecture videos, to help 100-level students in their mathematics and statistics courses.
8. Volunteer in the Math Tutoring Lab regularly for a semester, for at least one hour per week.
9. Assist an instructor with an upper-division mathematics or statistics course by holding additional office hours, recitations, or discussion sessions.
10. Attend one or more additional teaching-related seminars, or TLT training sessions.
11. Read and summarize a current research paper in peer-reviewed journal, e.g. Journal in Research in Math Education published by the NCTM.

Sample 2-credit Option A: All Basic Level Activities plus items 2, 5, 6 (create activities for the course you are grading for), and 10.

Sample 2-credit Option B: All Basic Level Activities plus items 2, 7 (create a set of online materials for the course you are grading for), and 10 (participate in at least 2 additional sessions related to the online content under development).

Sample 3-credit Option A: 1, 3, 4, 5, 10, and 11 (analyse a research paper relevant to the course you are leading, and discuss applicable ideas for improving the effectiveness of the course.) Develop a Teaching Portfolio.

Sample 3-credit Option B: 1, 6, 8, 9, 10, and 11 (analyse a research paper relevant to the course you are assisting with, and discuss applicable ideas for improving the effectiveness of the course.) Develop a Teaching Portfolio.

Reading Materials:


5. Selection of Richard Felder’s Articles on *Active Learning, Assessment of Learning, Creative and Critical Thinking, Cooperative Learning*. (Available at www4.ncsu.edu/unity/lockers/users/f/felder/public/Papers/Education_Papers.html)


**Student Learning Outcomes and Assessment Components:**

*I. Students demonstrate an understanding of effective pedagogical methods and best practices in teaching lower-division mathematics and statistics courses.*

A. Students participate in seminars and discussion sessions on pedagogy and develop an annotated bibliography of relevant reading materials. Students write essays summarizing current research on teaching and learning and/or describing their own approach to a specific aspect of teaching.

*II. Students demonstrate an understanding of content knowledge in lower level mathematics and statistics courses.*

A. Students design, develop, and edit course documents. These include teaching-specific documents (such as sample tests, quizzes, and homework assignments) and course-specific documents (such as a sample syllabus).

*III. Students display confidence and professionalism in delivering mathematics and statistics materials designed for a student audience (including lower division class materials, classes, group recitations, and help sessions).*

A. Assignments such as mock presentations, video-recorded mini-lessons, discussion of technology, and tips for board use make students feel comfortable in their delivery of the material. Each student’s confidence in their own presentation style is surveyed at the beginning and end of the course.

*IV. Students develop, reflect upon, and refine their own teaching philosophies.*

A. The transformation in each individual’s philosophy becomes apparent through a comparison of the student’s original teaching philosophy (written during Week 1) with his or her final teaching philosophy (submitted during Week 14).
Grading Policy:

The grade for this seminar will be based on the following components:

1. **Participation** (including group activities, training seminars and workshops, Math Lab and SI sessions).
2. **Teaching Materials** (including sample syllabi and lectures, sample assignments and group work).
3. **Writings** (including pedagogical essays or summaries, reports, and teaching philosophy).
4. **Presentations** (including lecture delivery, and oral presentations based on reading materials or teaching practice).

The weight of each component may be adjusted depending on the chosen number of credit hours. For example, for the one credit-hour option a possible weighting scheme is: Participation 20%; Teaching Materials 50%; Writing Component 15%; Presentation Component 15%.

The final grade will be calculated according to the following guidelines: at least 90% for an A, 86% for a B+, 80% for a B, 76% for a C+, 68% for a C.

Policies:

- **Attendance:** Attendance to all the organized events, including in-class lectures and group discussions and activities, is highly encouraged. Participation in class discussions, group activities, workshops, and seminars will be monitored and assessed for each student.

- **Honor Code:** The academic Honor Code forbids lying, cheating, and plagiarism. Plagiarism is defined as presenting the works of others as your own and copying sources without citation. Violations of the Honor Code, in particular plagiarism, may result in a grade of XF. The complete Honor Code can be found in the *Student Handbook at* [http://www.cofc.edu/generaldocuments/handbook.pdf](http://www.cofc.edu/generaldocuments/handbook.pdf).

- **American Disabilities Act:** In compliance with the Americans with Disabilities Act (ADA), all qualified students enrolled in this course are entitled to reasonable accommodations. Please notify the instructor during the first week of class of any accommodations needed for the course. You can also contact the Office of Disability Services at 843.953.1431.

Tentative Course Schedule with Specific Topics:

Week 1-2: Principles of Learning
We discuss the key learning principles that apply in general teaching contexts, the supporting research, and examples of how such principles are put into practice in mathematics and statistics classes.

Week 3-4: Learning Objectives and Assessment of Learning
We discuss how to design an effective learning experience for students, by establishing course goals and objectives that are meaningful, observable, and measurable. We also discuss strategies on how to develop assessment tools that are aligned with the stated objectives.

Week 5-6 Group Learning, Peer Instruction, Lecturing
We explore various types of learning activities of known effectiveness in 100- and 200- level mathematics and statistics classes. These include group learning in and outside the classroom, peer instruction, and traditional and non-traditional (e.g. flipped classroom) lecturing.

Week 7-8: Inquiry-Based and Problem-Based Learning, Writing in Mathematics and Statistics Classes
We will investigate strategies for designing and implementing inquiry-based and problem based classroom, structuring classroom activities around challenging and interesting problems, and using formal and informal writing assignments in mathematics and statistics classes.

Week 9-10: Technology in the Classroom
We will learn about a number of technology tools commonly used in mathematics and statistics classes, including, e.g., computer software and applications, presentation software, and interactive class tools (e.g. instant polls and quizzes).

Week 11: Inclusive Teaching, Learning Styles, Student Motivation
We will focus on effective strategies for creating an inclusive learning environment where every student can become fully engaged. We will learn about learning styles and what teaching methods and activities are suitable for different learning styles. We will also address the effect of motivation on learning and how to promote student motivation.

Week 12-13: Lesson Planning
Students will work on creating lesson plans for a 100-level mathematics or statistics course, including learning objectives, assessment, activities (both in-class and outside class), and strategies for maintaining good levels of student engagement and motivation. During the planning process, students will provide mutual feedback on the draft lecture plans, and proposed activities, and strategies.

Week 14: Conclusion
During the final week students will give presentations on what they accomplished in this seminar class. Presentations may be in the form of a class segment (e.g. a short lecture, or in-class activity) or a brief seminar on effective pedagogical strategies or tools. Students final products (syllabi, teaching materials, and essays) will be collected and assembled in a Graduate Teaching Seminar Portfolio, to be made available to other graduate students and instructors.
Additional Reading Materials:

1. *Writings* by Paulo Freire.
2. *Writings* by Maria Montessori.