College of Education Undergraduate Course Change Proposal
Signature Page

Course Title: Mathematics Teaching in the Middle Grades
Course Prefix and Number: MAE 4320 Type of Change: SUBSTANTIVE
Name of Faculty Sponsor: Rick Austin Telephone:
Email: austin@usf.edu

APPROVALS
List appropriate Department Chair, Committee Chair, Faculty Council Chair and Associate Dean
Approving:
Dr. Stephen Thornton
Department Chair
Signature

Rick Austin
Name of UPC Chair
Signature

Bill Young
College Council Chair
Signature

Michael Stewart, Ph.D.
Name of Associate Dean
Signature

CONCURRENCE
List other units and department of the University that have been consulted, comments and supporting remarks:

UNIT
CHOOSE ONE: CONCURRENCE, NON-CONCURRENCE or DEFER RECOMMENDATION
Name/Title
Signature
Date

UNIT
CHOOSE ONE: CONCURRENCE, NON-CONCURRENCE or DEFER RECOMMENDATION
Name/Title
Signature
Date

UNIT
CHOOSE ONE: CONCURRENCE, NON-CONCURRENCE or DEFER RECOMMENDATION
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Signature
Date

UNIT
CHOOSE ONE: CONCURRENCE, NON-CONCURRENCE or DEFER RECOMMENDATION
Name/Title
Signature
Date

COUNCIL/DEAN APPROVALS
Recommendation of Undergraduate Council: Approved: ___ Disapproved: ___
Signature of Undergraduate Council Chair: ____________________________ Date
Action by the Undergraduate School Dean: Approved: ___ Disapproved: ___
Signature of Undergraduate Dean: ____________________________ Date
Effective Date (Term): ____________________________
College of Education
UNDERGRADUATE COURSE CHANGE PROPOSAL

PLEASE INDICATE THE TYPE OF CHANGE YOU ARE REQUESTING TO MAKE:

SUBSTANTIVE: Change in course syllabus

NON-SUBSTANTIVE: 

1. DEPARTMENT AND CONTACT INFORMATION

Department: Secondary Education
College: Education
Budget account number: 172400 Secondary Education
Faculty Contact Name: Rick Austin
Phone: 
E-mail: austin@usf.edu

2. CURRENT COURSE INFORMATION

Prefix: MAE    Number: 4320

Full Course Title:
Mathematics Teaching in the Middle Grades

Abbreviated Course Title: (not to exceed 30 characters)
Math Teaching MG

The course title is variable? ○ Yes ○ No

Is a permit required for registration? ○ Yes ○ No

Are the credit hours variable? ○ Yes ○ No

Credit hours (list max if variable): 3

Total Clock Hours: 45

Section Type: Class Lecture (Primarily) Grading option: Regular

Prerequisites
18 semester hours of mathematics (or Consent of Instructor)

Corequisites

Co-Prerequisites
Course Description (not to exceed 255 characters including spaces)

This course is required in the undergraduate Mathematics Education program and is to be taken as a pre-requisite for MAE 4330. Its major goal is to provide prospective middle school teachers the opportunity to develop concepts, skills, and pedagogical

Please indicate in the description if the course:
* is restricted to majors or non-majors
* is repeatable for credit and, if so, for how many total credits

3. **New Course Information** (leave unchanged fields blank):

   New Prefix:   New Number:   

   New Full Course Title: 

   New Abbreviated Course Title: (not to exceed 30 characters) 

   The course title is variable?  ○Yes  ○No

   Is a permit required for registration?  ○Yes  ○No

   Are the credit hours variable?  ○Yes  ○No

   New Credit hours (list max if variable):   New Total Clock Hours: 

   New Section Type:   New Grading option: 

**New Prerequisites**

Admission to Mathematics Education Program or Cl.

**New Corequisites**

**New Co-Prerequisites**
This course provides prospective middle school teachers the opportunity to develop concepts, skills, and pedagogical procedures for effective teaching of mathematics in grades 5-9.

Please indicate in the description if the course:
- is restricted to majors or nonmajors
- is repeatable for credit and, if so, for how many total credits

4. **JUSTIFICATION:**

   a. **Nature of change(s):** Be specific. (Indicate the nature of all changes, i.e., change of objectives, course level, etc. State the reasons why the change is necessary and how it will improve the course or program.) A structural analysis of the course should be included. Indicate where this course is in relation to other courses in the program. How will the change impact the enrollment of the course? Does this change affect accreditation or certification?

   The Prerequisites were changed to insure that students take this course before others in the program.
   The course description was shortened to fit the new limits.
   The course objective dealing with technology was dropped, because of overlap with other courses within the program and thus avoiding duplication.

   (Items “4.b.” – “4.f.” are ONLY for Substantive Course Changes)

   b. Indicate how this course will strengthen the Undergraduate Program.

   This course has always been a part of the undergraduate program in mathematics education. The changes provide a bit more structure for students to plan their programs, and avoid some duplication of efforts that have occurred in the past.
c. What specific area of knowledge is covered by this change that is not covered by courses currently listed?

The entire focus upon teaching mathematics that is appropriate for middle grades students. This focus is only found in this course. This course requires students to reexamine the mathematics that is typically taught at the middle grades level from a teacher perspective.

d. What is the need or demand for this course? (Here you must indicate if this course is part of a required sequence in the major.) What other programs would use this course?

This course is one of two that all new students in the mathematics education program must take early in their program of study. The course is required for all mathematics education majors. The class is currently taught once each year in the Fall Semester. The last two years have had enrollments of 32 and 37 students.

e. What qualifications and/or experience are necessary to teach this course?

At least a master's degree and 18 graduate hours in mathematics education. Former teaching at the middle grades level as well as PhD degree are preferred.

f. What will be the effect of this change on the program and on the students? Do you plan to drop a course of this change is made?

No course will be dropped. The change to students will be that because of the once per year offering students will need to begin the required mathematics education courses in the fall semester. There will be a clear sequence of classes to follow.
5. **OTHER COURSE INFORMATION** – Required for submission to the Statewide Course Numbering System (You must complete this section with the requested items. “n/a” or “unchanged,” etc. is not acceptable) If this section is not filled out, the course change will NOT be made!

   a. **Course Objectives/Student Learning Outcomes**

   1. knowledge of the major goals and characteristics, including scope and sequence, of middle school mathematics programs, and aspects of theories of learning as applied to the planning of instruction for the teaching of middle school mathematics;

   2. knowledge of the current developments in education, including research, that may affect the middle school mathematics curriculum;

   3. knowledge of problem-solving processes, instructional procedures, and their application in the teaching of middle school mathematics;

   4. knowledge of both content and process standards for teaching and learning middle grades mathematics

   5. knowledge and application of instructional procedures appropriate for developing rational number operations, number theory, beginning algebra, geometry, measurement, spatial visualization, and probability and statistics.

   b. **Major Course Topics**

   MAIN topics to be addressed are as follows:

   - Mathematics Teaching/Learning in the Middle Grades

   - Problem Solving in the Middle Grades

   - Number Sense/Estimation in the Middle Grades

   - Whole Number Computation/Rational Number Computation

   - Patterns & Functions/Algebra in the Middle Grades

   c. **Course Textbooks**

   Required TEXT:
   Current edition of a middle grades methods text. One example is the current edition of Teaching and Learning Middle Grades Mathematics by Rheta N. Rubenstein, Charlene E. Beckmann and Denisse R. Thompson.


   Recommended Resources:


6. **Gordon Rule/General Education**

   This course is certified for:

   Not a part of Gordon Rule nor General Education

7. **Syllabus** – If this is a substantive course change you MUST attach a copy of the syllabus.
1. **Course Prefix and Number:** MAE 4320

2. **Course Title:** Mathematics Teaching in the Middle Grades

3. **Regular Instructor(s):**
   - Dr. Denise R. Thompson
   - Dr. Helen Gerretson
   - Dr. Rick Austin
   - Dr. Gladis Kersaint
   - Dr. Eugenia Vomvoridi-Ivanovic

4. **Course Prerequisites (if any):** Admission to Mathematics Program or CI.

5. **Course Description:**

   This course provides prospective middle school teachers the opportunity to develop concepts, skills, and pedagogical procedures for effective teaching of mathematics in grades 5-9.

6. **Course Goals and Objectives:**

   Upon completion of this course, students will have demonstrated:

   1. Knowledge of the major goals and characteristics, including scope and sequence, of middle school mathematics programs, and aspects of theories of learning as applied to the planning of instruction for the teaching of middle school mathematics;

   2. Knowledge of the current developments in education, including research, that may affect the middle school mathematics curriculum;

   3. Knowledge of problem-solving processes, instructional procedures, and their application in the teaching of middle school mathematics;

   4. Knowledge of both content and process standards for teaching and learning middle grades mathematics;

   5. Knowledge and application of instructional procedures appropriate for developing rational number operations, number theory, beginning algebra, geometry, measurement, spatial visualization, and probability and statistics.

7. **Content Outline:**

   MAIN topics to be addressed are as follows:

   - Mathematics Teaching/Learning in the Middle Grades
   - Problem Solving in the Middle Grades

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- Number Sense/Estimation in the Middle Grades
- Whole Number Computation/Rational Number Computation
- Patterns & Functions/Algebra in the Middle Grades
- Spatial Sense/Geometry in the Middle Grades
- Measurement in the Middle Grades
- Statistics & Probability in the Middle Grades

ADDITIONAL topics integrated throughout the course are as follows:

- Mathematics Assessment in the Middle Grades
- Role of Calculator Technology
- Cooperative Learning in Middle Schools
- Mathematics and Multiculturalism
- Mathematics, Equity, and Gender
- Mathematical Communication, Connections, and Reasoning

8. **Evaluation of Student Outcomes:**

Students’ achievement of course goals and objectives are based on the following assessments.

- Midterm and/or Final Exam
- Field-based Participant Observation Report  (AP #3 and #11) core assignment
- FTCE/FCAT Middle School Review  (AP #8) core assignment
- Other Assignments may include but are not limited to:
  - Mini-Teaching Presentations
  - Textbook Analysis
  - Mini-Study Assignment
  - Problem Solving Demo Lesson
  - Analysis of Student Work
  - Journal Article Commentary
  - Lesson/Video Critique
  - Performance Task Interview
  - Reflections on Readings
  - Standards Assignment

9. **Grading Criteria:**

Course grades are based upon the following:

- Midterm and/or Final Exam 20% – 25%
- Field-based Observation Report 10% – 15%
- FTCE/FCAT Review 5% – 10%
- Special Assignments 60% – 70%

The following plus and minus system adopted by the USF Faculty Senate will be used.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
<th>Letter</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>94 – 100%</td>
<td>A (4.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90 – 93%</td>
<td>A- (3.67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>87 – 89%</td>
<td>B+ (3.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>84 – 86%</td>
<td>B (3.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 – 83%</td>
<td>B- (2.67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>77 – 79%</td>
<td>C+ (2.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>74 – 76%</td>
<td>C (2.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 – 73%</td>
<td>C- (1.67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67 – 69%</td>
<td>D+ (1.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64 – 66%</td>
<td>D (1.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 – 63%</td>
<td>D- (0.67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 – 59%</td>
<td>F (0.0)</td>
<td></td>
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</tr>
</tbody>
</table>

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In addition, core assignments must be accomplished with at least a score of adequate and recorded into the Chalk and Wire system in order to earn a passing grade for the course, in accordance with Secondary Education Department policy.

10. **Textbook(s) and Readings:**

    **Required TEXT:**
    Current edition of a middle grades methods text. One example is the current edition of *Teaching and Learning Middle Grades Mathematics* by Rheta N. Rubenstein, Charlene E. Beckmann and Denisse R. Thompson.

    **Required KIT:** ETA H.O.T. Secondary Level Kit–Grades 6-10.

    **Recommended Resources:**


    Journals (e.g., *Teaching Children Mathematics, Mathematics Teaching in the Middle School, Learning, Computing Teacher, The Mathematics Teacher, Middle School Journal, Instructor, School Science and Mathematics, Journal for Research in Mathematics Education*).

    Next Generation Sunshine State Standards; http://floridastandards.org/index.aspx

11 (a) **ADA Statement:** Students with disabilities are responsible for registering with the Office of Student Disabilities Services in order to receive special accommodations and services. Please notify the instructor during the first week of classes if a reasonable accommodation for a disability is needed for this course. A letter from the USF Disability Services Office must accompany this request.

11(b). **USF Policy on Religious Observances:** Students who anticipate the necessity of being absent from class due to the observation of a major religious observance must provide notice of the date(s) to the instructor, in writing, by the second class meeting.

11(c). **A Reminder:** In the event of an emergency, it may be necessary for USF to suspend normal operations. During this time, USF may opt to continue delivery of instruction through methods that include but are not limited to Blackboard, Eliminate, Skype, and email messaging and/or an alternate schedule. It’s the responsibility of the student to monitor Blackboard for each class for course specific communication, and the main USF, College, and department websites, emails, and MoBull messages for important general information.

11. **Please complete Attachment I (for College of Education files).**

    Complete Attachment I, including the matrix by listing the (1) course objectives, (2) related topics, (3) evidence of achievement (including performance-based assessments, as appropriate) to be used to ensure that students have acquired the objectives, and identify the correlated Accomplished Practices (Attachment II), if applicable.

    *See Attachment I.*

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COLLEGE OF EDUCATION
DEPARTMENTAL COURSE SYLLABUS
ATTACHMENT I

Please respond to each of the following questions and complete the attached Matrix:

1. **Rationale for Setting Goals and Objectives:** What sources of information (e.g., research, best practices) support the formulation and selection of course goals and objectives.

   The National Council of Teachers of Mathematics (NCTM) publication, *Principles and Standards for School Mathematics* (2000), continues to be a guiding influence on this program. The Florida Department of Education's *Education Standards Commission Subject Matter Standards*, are reflected in the mathematics selected for use as examples in this class.

2. List the specific competencies addressed from the *relevant national guidelines.*

   The guidelines are from the National Council of Teachers of Mathematics, NCTM. While the program is designed for certification at the secondary, 6 – 12 grade level, this course has a 6 – 8 grade, middle school focus for each of the guidelines.

   - 2.1 identification and modeling of the various strategies used in problem solving
   - 2.2 the use of calculators in teaching mathematics
   - 2.3 the use of concrete materials and other appropriate models in teaching mathematics
   - 2.4 the use of appropriate resource material
   - 2.5.1 clear communication of mathematics concepts
   - 2.5.3 various teaching strategies
   - 2.7 methods of assessment
   - 3.1 early field experience, prior to internship.

3. Are there field-based experiences in this course? If so, please briefly indicate nature and duration.

   Field-based experiences are required in this course through the *Field-based Participant Observation Assignment.* Students must conduct at least 15, 50-minute observations in one/two middle school classrooms during the semester. This component provides secondary education students to become more familiar with the "everyday life" of the middle school teacher and adolescent, and aspects of the "middle school philosophy." As they learn various approaches and techniques in the course, they apply them to the classroom setting to the extent possible (with the permission of the cooperating teacher.) Students perform as many different activities as possible, including: (a) interacting with students and participating in their mathematics activities to understand just how they "give meaning to" and "make sense of" the mathematics; (b) aiding the classroom teacher in evaluating assignments (homework, tests, class work, projects); (c) tutoring an individual or a small group of students; (d) reviewing homework/class work with the students; (e) teaching a lesson; and, (f) conducting an activity using the calculator or doing an enrichment activity using a game or some manipulative with the class. At the end of the semester, students are required to submit a full *Field-based Participant Observation Report* including a Visitation Log (signed by cooperating teacher(s); Daily Journal Notes (daily personal reflections on the observed class and activities conducted with the students); and a Final Report (summary reflecting thoughts on the entire field-based experience, including benefits, concerns about teaching in the middle school).

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4. Is technology used in this course? If so, please briefly indicate type of technology and how it is used to manage, evaluate and improve instruction. Are students provided opportunities to access and/or demonstrate use of technology in instruction in this course? If so, please briefly describe.

Calculator and computer technology is used in the course as appropriate. Specifically, fraction and graphing calculators are used as part of the activities supporting a number of the main course topics (e.g., number sense & computations). Students have access to calculators throughout the course and are allowed to use them during discussions, assignments, and examinations.

5. List the specific competencies addressed from the Florida Adopted Subject Area Competencies, if applicable.

This is a methods course and as such students are involved with many of the mathematics competencies as examples used in the class, but the goal is not to specifically teach any of the mathematics content. Students are to have that content mastered prior to being admitted into the mathematics education program.

6. Are there any components of the course designed to prepare teacher candidates to help K-12 students achieve the Sunshine State Standards? If so, please identify.

The Florida Next Generation Sunshine State Standards closely mirror the national mathematics standards for grades 6-8. Each of the main course topics represents a broad content area of the state and national standards. By studying in depth these content areas, teach candidates are exposed to numerous strategies for helping middle school students achieve the state standards.
7. Complete the following matrix showing the association among (1) course objectives (item #6 of syllabus), (2) related topics, (3) evidence of achievement of objectives (including performance-based assessments, as appropriate), and (4) Accomplished Practices (Undergraduate and Plan II Master's Programs).

<table>
<thead>
<tr>
<th>Course Objectives</th>
<th>Topics</th>
<th>Evidence of Achievement</th>
<th>Predominant Accomplished Practices*</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Note: Objectives should be numbered 1.0, 2.0, 3.0, etc.)</td>
<td>What topics are used to fulfill each objective?</td>
<td>(For Undergraduate and Plan II Masters Courses Only)</td>
<td></td>
</tr>
<tr>
<td>1.0 knowledge of the major goals and characteristics, including scope and sequence, of middle school mathematics programs, and aspects of theories of learning as applied to the planning of instruction for the teaching of middle school mathematics;</td>
<td>1.1 Math Teaching/Learning in MS All content-related topics Cooperative Learning Math Communication, Connections, &amp; Reasoning</td>
<td>Midterm and / or Final Exam Special Assignments Formal/Informal Observations/Interviews</td>
<td># 10 planning</td>
</tr>
<tr>
<td>2.0 knowledge of the current developments in education, including research, that may affect the middle school mathematics curriculum;</td>
<td>2.1 Math Teaching/Learning in MS All content-related topics Math, Equity, and Gender Math and Multiculturalism</td>
<td>Midterm and / or final Exam Special Assignments Formal/Informal Observations/Interviews</td>
<td># 8 subject knowledge #3 continuous improvement</td>
</tr>
<tr>
<td>3.0 knowledge of problem-solving processes, instructional procedures, and their application in the teaching of middle school mathematics;</td>
<td>3.1 Math Teaching/Learning in MS Problem Solving Role of Calculator Technology Cooperative Learning</td>
<td>Midterm and / or final Exam Special Assignments Formal/Informal Observations/Interviews</td>
<td># 8 subject knowledge #2 communication</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>4.0</th>
<th>knowledge of both content and process standards for teaching and learning middle grades mathematics</th>
<th>4.1</th>
<th>Math Teaching/Learning in MS All Content-related Topics Math Communication, Connections, &amp; Reasoning</th>
<th>Midterm and / or final Exam Special Assignments Formal/Informal Observations/Interviews</th>
<th># 8 subject knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td>knowledge and application of instructional procedures appropriate for developing rational number operations, number theory, beginning algebra, geometry, measurement, spatial visualization, and probability and statistics.</td>
<td>6.1</td>
<td>Math Teaching/Learning in MS All Content-related Topics Math Communication, Connections, &amp; Reasoning Math Assessment in the MS</td>
<td>Midterm Progress Exam Final Exam Special Assignments Formal/Informal Observations/Interviews</td>
<td># 8 subject knowledge # 10 planning</td>
</tr>
</tbody>
</table>

**Note:** Examples of Indicators for the Accomplished Practices can be found in J:\Proposals Course-Program\Faculty Resource Packet for Accomplished Practices.
ATTACHMENT II

Departmental Course Syllabus

Preprofessional Benchmarks for the Accomplished Practices

Practice #1 — Assessment: The preprofessional teacher collects and uses data gathered from a variety of sources. These sources will include both traditional and alternate assessment strategies. Furthermore, the teacher can identify and match the student’s instructional plan with their cognitive, social, linguistic, cultural, emotional, and physical needs.

Practice #2 — Communication: The preprofessional teacher recognizes the need for effective communication in the classroom and is in the process of acquiring techniques which she/he will use in the classroom.

Practice #3 — Continuous Improvement: The preprofessional teacher realizes that she/he is in the initial stages of a life-long learning process and that self-reflection is one of the key components of that process. While her/his concentration is, of necessity, inward and personal, the role of colleagues and school-based improvement activities increase as time passes. The teacher’s continued professional improvement is characterized by self-reflection, work with immediate colleagues and teammates, and meeting the goals of a personal professional development plan.

Practice #4 — Critical Thinking: The preprofessional teacher is acquiring performance assessment techniques and strategies that measure higher order thinking skills in students and is building a repertoire of realistic projects and problem solving activities designed to assist all students in demonstrating their ability to think creatively.

Practice #5 — Diversity: The preprofessional teacher establishes a comfortable environment which accepts and fosters diversity. The teacher must demonstrate knowledge and awareness of varied cultures and linguistic backgrounds. The teacher creates a climate of openness, inquiry, and support by practicing strategies [such as acceptance, tolerance, resolution, and mediation.

Practice #6 — Ethics: The preprofessional teacher adheres to the Code of Ethics and Principles of Professional Conduct of the Education Profession in Florida.

Practice #7 — Human Development and Learning: Drawing upon well established human development/learning theories and concepts and a variety of information about students, the preprofessional teacher plans instructional activities.

Practice #8 — Knowledge of Subject Matter: The preprofessional teacher has a basic understanding of the subject matter and is beginning to understand that the subject is linked to other disciplines and can be applied to real world integrated settings. The teacher’s repertoire of teaching skills include a variety of means to assist student acquisition of new knowledge and skills using that knowledge.

Practice #9 — Learning Environments: The preprofessional teacher understands the importance of setting up effective learning environments and has techniques and strategies to use to do so including some that provide opportunities for student input into the processes. The teacher understands that she/he will need a variety of techniques and is working to increase knowledge and skills.

Practice #10 — Planning: The preprofessional teacher recognizes the importance of setting high expectations for all students. The preprofessional teacher works with other professionals to design learning experiences that meet students’ needs and interests. The teacher candidate continually seeks advice/information from appropriate resources including feedback, interprets the information, and modifies her/his plans appropriately. Planned instruction will incorporate a creative environment and utilize varied and motivational strategies and multiple resources for providing comprehensible instruction for all students. Upon reflection, the teacher continuously refines outcome assessment and learning experiences.

Practice #11 — Role of the Teacher: The preprofessional teacher communicates and works cooperatively with families and colleagues to improve the educational experiences at the school.

Practice #12 — Technology: The preprofessional teacher uses technology as available at the school site and as appropriate to the learner. She/he provides students with opportunities to actively use technology and facilitates access to the use of electronic resources. The teacher also uses technology to manage, evaluate, and improve instruction.

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