Savannah State University
New Programs and Curriculum Committee
Summary Page – Form I

1. **Submitting College:** SOTE

2. **Department(s) Generating The Proposal:** Choose an item.
   Choose an item. (if needed)

3. **Proposal Title:** Mathematical Literacy for Diverse Classroom

4. **Course Number(s):** MAED 3000

5. **Course Title(s):** Mathematical Literacy for Diverse Classroom

6. **Effective Date:** Fall **Year: 2016**

7. **Brief Summary of Proposal:** According to the mathematics education researchers, today's students require active teaching strategies, infused with literacy practices that engage the learner and make learning relevant. Since this important topic is not approached in none of the existing courses offered by The School of Teacher Education, there was an imperative to create a course that will equip teacher candidates with literacy skills. One of the aims of the mathematics education program is to offer the premises of creating mathematically literate citizens capable of reasoning quantitatively and qualitatively.

8. **Type of Proposal:** New Course **If other, please describe:** Click here to enter text.

9. **Impact on Library Holdings**
   Existing: Current Holdings
   Additional: New Purchases as needed
   Deletions: NA

10. **Impact on Existing Programs:** None. This course is designated to meet GaPSC Rules for Teacher Preparation and more specifically for edTPA assessment requirement.

11. **Additional Resources Required**
    Personnel: None
    Non-personnel: None

12. **Approvals:**

- Department Curriculum Committee Signature Kisha R. Cunningham Date 4/17/16
- Department Chair Signature_____ Date_____
- College Curriculum Committee Signature [illegible] Date 4/17/16
- College Dean Signature [illegible] Date 04/18/16
- Vice President of Academic Affairs Signature K Holmes Date 5/2/16
  (Chair of the New Programs and Curriculum Committee)
- Faculty Senate Signature Kenneth A. Jordan Date 5/3/16

Savannah State University
New Programs and Curriculum Committee
Course Addition Page - Form II

1. **Course Number:** MAED 3000

2. **Course Title:** Mathematical Literacy for Diverse Classroom

3. **Catalog Description:**

This course explore methods for teaching middle and high school students to read, write, think, and learn in ways that allow them to master the subject matter and meaningfully apply their understanding. Candidates learn to plan lessons that teach content and nurture greater literacy. Pre-, during-, and post-reading strategies are explored, along with assessment methods that give students a continual view of their literacy progress and achievement. Classroom adaptations for culturally and linguistically diverse population in the content areas are also addressed.

4. **Rationale:**

According to the mathematics education researchers, today's students require active teaching strategies, infused with literacy practices that engage the learner and make learning relevant. Since this important topic is not approached in none of existing courses offered by School of Teacher Education, there was an imperative to create a course that will equipe teacher candidates with literacy skills. One of the aims of the mathematics education programs is to offer the premises of creating mathematically literate citizens capable of reasoning quantitatively and qualitatively. Some of the qualities of an effective math teacher are the capacity to analyze, reason and communicate effectively as they pose, solve and interpret mathematical problems in a variety of situations involving quantitative, spatial, probabilistic or other mathematical concepts. The goal of the Mathematical Literacy for Diverse

5. **Credit Hours:** 3 Credit Hours

6. **Pre-requisites:** Admission to School of Teacher Education

7. **Syllabus:** See attached

8. **Similarity to or duplication of Existing Courses:**

N/A

9. **Textbook Selection:**

Kenney, M., Joan (2005). Literacy Strategies for Improving Mathematics Instruction, Association for Supervision and Curriculum Development

10. **Grading:**

Grading Scale: A (90-100); B (80-89); C (70-79); D(60-69); F (Below 60)

MAED 3000 Mathematical Literacy for Diverse Classroom

Savannah State University

School of Teacher Education

Instructor: Dr. Mihaela Munday

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Phone: 912-358-4216, Email: mundaym@savannahstate.edu

Office hours:

Class Time:

Room:

Instructor's Education:

Ph.D. Applied Mathematics "Babes Bolyai" University, Cluj, Romania, 2010

B.S. Mathematics Education " A.I.Cuza" Iasi University, Romania, 1993

Catalog Course Description

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Course Objectives

At the end of this course the students will be able to:

1. Understand how the Literacy in Mathematics Models benefit students.
2. Understand how active learning strategies increase student understanding of math concepts.
3. Gain practical examples of resources and strategies to use in the math content area.

Expected Student Learning Outcomes:

As a result of the learning opportunities and activities of this course, the learner will be able to:

1. **Observe, analyze and document** the changing social and cultural conditions that impact teaching and learning mathematics.
2. **Discuss** Literacy in Mathematics on a regular basis.
3. **Demonstrate** language function proficiency essential for students to learn mathematics.
4. **Create** tasks that provide opportunities to practice using language functions.
5. **Demonstrate** language demand proficiency: vocabulary and/or symbols, mathematical precision, syntax and discourse associated with language functions.
6. **Design** instructional support to meet the needs of students with different levels of language learning.
7. **Make** connections among mathematics, other content areas, everyday life, and the workplace.
8. **Incorporate** knowledge of individual differences and the cultural and language diversity that exists within classrooms and **discuss** culturally relevant perspectives as a means to motivate and engage students.

Required Texts:

Literacy Strategies for Improving Mathematics Instruction, (2005), Association for Supervision and Curriculum Development, Alexandria, GA.
For All Practical Purposes: Mathematical Literacy In Today's World (2013), 9th Ed, W.H. Freeman and Company.
Mathematical Literacy in the Middle and High School Grades, (2010), Faith Wallace, Mary Anna Evans, Pearson.

Additional Readings (Readings will be available in D2L)

Using Graphic Organizers to Improve the Reading of Mathematics, Stephania Braselton and Barbara C. Decker, 1994. *The Reading Teacher*, Vol. 48, No. 3, Teachers' Choices for 1994: Best New Children's Books (Nov., 1994)

Instructional Methods and Requirements:

This course will utilize various methods of instructions, i.e., lecture notes, small group analysis, class discussion and resolution of current educational issues. Students will also be responsible for class and online discussion based upon readings, lectures and videos. Students will further develop skills of reflection and practice in decision making, communication, group leadership, conflict resolution, and evaluative skills.

Students are expected to come to class prepared to discuss readings, and use computer technology and research for course assignments and final research paper. ALL CLASS ASSIGNMENTS MUST BE TYPED AND PRESENTED TO THE INSTRUCTOR BEFORE CONCLUSION OF CLASS. ALL ONLINE ASSIGNMENTS MUST BE SUBMITTED BY 11:59PM ON DUE DATE. LATE PAPERS WILL BE DEDUCTED TWO POINTS FOR EACH DAY LATE. Assignments stress critical thinking skills and emphasize concepts and ideas rather than memorization of facts.

Grading Scale

The grading scale below will be used to determine your final grade:

90-100	A
80-89	B
70-79	C
60-69	D
Below 60	F

Calculating the Final Grade:

Assignment	Point Percent
Case Studies	20%
Chapter Quizzes	10%
Final Exam	10%
Midterm Exam	5%
Project-based Assignments	15%
Written Assignments	40%
Total	100%

Evaluation:

Mastery of the course objectives will be assessed via a combination written exams, abstract writing, presentations and performance-based assignments.

Case Studies (20%)

Teaching Case Studies and In-Class Activities
Teaching case studies are small projects that are assigned and completed in the context of the class. Teaching case studies provide the opportunity to practice and apply new concepts and may be related to readings.

Chapter Exams (10%)

Exams cover content from class sessions and the chapters in the textbook. The questions will consist of short-answer questions (e.g., multiple-choice questions, true- false, matching) and a few essay questions. [If you are absent, the quiz MUST be taken NO LATER than Monday of the following week].

Final Exam (10%)
The final exam will provide you an opportunity to synthesize important concepts in the course. The final will address ideas from readings, class discussions and the assignments.

Midterm Exam (5%)
The midterm exam will provide you an opportunity to synthesize important concepts midway through the course. The midterm will address ideas from readings, class discussions and the assignments.

Project Based Assignments (15%)

- Teach-made 30-50 item paper and pencil test from a unit of study in content area.
- Multiple Technology Integrated Assignments

Written Assignments (40%)

Written Assignments are comprised of written assignments completed in and outside of class. These assignments are designed to both help you understand and highlight the main points of the content you are reading. This is a very important part of your grade– it is there to help you but can also definitely hurt your grade if not done.

- Reaction Paper
- One-page summary reports

No credit will be given for late work. You must post answers to assignments in the Assignment Inbox of D2L by the due date. The information covered in the article work for that week will be covered in the lectures and class work for that session.

Writing Assignments MUST be submitted by 11:59pm on due date. No late papers will be accepted.

Schedule of Course Activities
Course calendar of activities, rubric, syllabus and related course material are posted in Desire2Learn (D2L) Course Management System.

Week 1

Mathematics as a Language

1. Assignments & Activities:
2. Modeling and formulating
3. Transforming and manipulating
4. Inferring
5. Communicating.

Activities:

- Descriptions of mathematical literacy,
- Reflection on how each participant acquired a second language (open discussion)
- Discussion on common threads in language acquisition
- Beginning list of mathematics vocabulary
- Working with visual representations that:
    - stimulate vocabulary development
    - inform text.

Assignment: Create a concept map for "percent" and a Frayer model for "prime".

Reading: *Using Graphic Organizers to Improve the Reading of Mathematics* (Braselton & Decker, 1994).

Weeks 2&3

Reading in the Mathematics Classroom

- Reading Requirements for Mathematics Text
- Same words, Different Languages
- Small Words, Big Differences
- Strategic Reading
- Other Reading Strategies
- Guided Reading

Activities

- Representations of concept maps and Frayer models
- Reflection on how each student acquired mathematical language (open discussion).
- Discussion of "Teaching the Language of Mathematics" (Krussel, 1998)
- Refining of graphing organizers for specialized use in mathematics
- Assignment: Write a comparison of personal experience in acquiring a second language, and in acquiring mathematical language.

Readings:

1. *Semantic Aspects of Quantity* (Schwartz, 1996)
2. *Assessing Mathematical Skills and Understanding Effectively* (Schwartz & Kenny, 1999)
3. "*Handwriting Mastery*" (Allen, 2003)
4. *Text Organization and Its Relation to Reading Comprehension* (Dickinson, Simmons & Kameenui, 2000)

Weeks 4&5

Writing in the Mathematics Classroom

- Linguistic Versus Logical-Mathematical Intelligence
- Changing Perceptions and new Expectations
- Written Responses to Mathematics Problems
- Writing as a Prerequisite for Assessment of Student Learning
- Mathematics Writing and ESL Students
- The Cognitive Academic Language Learning Approach
- Student Writing and Special Needs
- Writing Supports

Activities:

- Sharing of language acquisition comparison.
- Introduction to *Reading and Writing in Mathematics*, 2nd Ed. (Borton& Heidema, 2002)
- Introduction to action research and Qualitative&Action Research (Grady, 1998)
- Exploration of various bibliographies using library resources.
- Document search at university library.

Assignment: Write up a draft focus paper.

Readings:

1. *Strategies to Support the Learning of the Language of Mathematics* (Rubenstein, 1996)
2. *Mathematics as a Language* (Usiskin, 1996)
3. *Using Student Contributions and Multiple Representations to Develop Mathematical Language* (Herbel-Eisenmann, 2002)

Week 6

Graphic Representation in the Mathematics Classroom

- Reading Graphics: Mixed Metaphors and Double-Edged Words
- Artful Listening in Mathematics: The Subtleties of Syntax
- Mathematics: A Visual Language for all Students

Activities:

Language work update and overview:

- Question: "Why it is so difficult?"
- Discussion of personal experiences of language impeding mathematical learning
- Discussion of content development and literacy issues using sample tasks from *Balanced Mathematics Assessment for the 21st Century* (Schwartz, 2000)
- Discussion of focus questions:
    - What difficulties does each task represent in the areas of vocabulary, format, reading level, lack of clarity, and ambiguousness?
    - What changes would you make to the text in order to facilitate access to the mathematics?

Weeks 7&8

Discourse in the Mathematics Classroom

- Create Discourse-Friendly Classrooms
- Discourse and Computation
- Discourse and Problem Solving
- Discourse and Vocabulary
- Using Concept Maps to Foster Discourse

Activities:

Continuation of literature review:

The Role of Reading Instruction in Mathematics (Curry, 2004)
Teaching Content Area Vocabulary (Graves, 2004)
Literacy in the Language of Mathematics (Bullock, 1994)
Assignment: Write up an incident around mathematical language that you observe in a classroom, or interview a teacher regarding language issues.

Readings: The following articles are all from the November 2002 issue of *Educational Leadership*:

1. *From Efficient Decoders to Strategic Read* (Vacca)
2. *Teaching Reading in Mathematics and Science* (Barton, Heiden, & Jordan)
3. *Advance Math? Write!* (Brandenbury)
4. *Seven Literacy Strategies That Work* (Fisher, Frey, & Williams)

Week 9

Creating Mathematical Metis

- Creating Metis for Teachers
- Action Research as an Aid to Metis
- Task Clusters
- What Students need to Know

Activities

Discuss the central focus questions:

- What does it mean to be literate in different content areas?
- What do we mean when we say that students can't read?
- What do students need to do to read for meaning in a content classroom?
- What is the content teacher's responsibility for teaching students to use reading as a learning tool?

Readings:

Writing to Learn Mathematics: Strategies That Work, K-12 (Countryman, 1992)

The Role of Reading Instruction in Mathematics (Curry, 2004).

Week 10

Literacy and Mathematics in Culture

- Poetry and Music: A Most Mathematical Approach to Words
- Math and Meter
- Math as a Springboard to Verbal Creativity

Activities:

1. Poetry Counts
2. Fractions, Poetic Meter, and Spoken English
3. Relating Vibrational Frequency to Pitch with Ratios
4. Rhythm and Language-Bringing Poetry, Music, and Mathematics Together
5. Catenaries, Large and Small-Visual Calculus

Readings:

Merriam-Webster. (2010). Definition of "polygon". http://www.merriam-webster.com/.

Weeks 11&12

Environmental Print: Math in Daily Life

- Ideas for using Environmental Print in Class:
    - Level 1: Practicing Problems
    - Level 2: Constructing Knowledge About Problem Solving
    - Level 3: Thinking Critically About Mathematics and Literacy

Activities:

Level 1: Checking the Fine Print for Ways to Practice Mathematical Skills:

Find the Math in This Simulated Frequent Buyer Program

Level 2: Assembling Knowledge as it Pertains to Citizenship-The impact of Polls on Elections:

A Poll is Only as Good as the Questions Asked

Level 3: Think Critically About Research Studies-Do Statistics Lie?

How Can Two Contradictory Studies Both be True?

Reading:

Clark, K.K. & Wallace, F.H. (2007). Alternative uses for junk mail: How environmental print supports mathematical literacy. *Mathematics Teaching in the Middle School*, 12(6), 326-332.

Weeks 12&13

Math Literacy and the Electronic Culture: Social Media, Gaming, and Reality Shows

- Social Media
- A word about constant change: How will you deal with it over the course of your career?
- Games and their relationship to math and literacy
- Simulation Games: The Algebra Connection
- Geometry in Computer Gaming
- Television Reality Shows

Activities:

1. Tweets that go on forever and ever-Lesson Plan
2. What can reality shows teach us about American electoral politics?

Week 14 Wrap up and Final Exam

Class Attendance Policy:

Savannah State University endeavors to provide optimum conditions for student learning. Class attendance is, therefore, required of students to ensure that they will be exposed to the many classes, laboratories, and related experiences provided for their benefit. Extenuating circumstances may at times make it difficult for students to attend every class meeting. Students who are unable to attend a class should notify the professor in a timely manner and arrange the conditions under which any required work may be made up. Credit may or may not be awarded for any course if the number of absences exceeds the number of times that the class meets per week. Students who exceed the allowed number of absences in any course may receive a grade of "F" or be administratively withdrawn. Students who are withdrawn at or before mid-semester will receive a grade of "W"; students withdrawn after mid-semester will receive a grade of "WF" unless extenuating circumstances occur (see "Grading System"). Students may not withdraw from Academic Assistance (Learning Support) courses. Withdrawal from these courses results in an automatic cancellation of registration and withdrawal from the University. During the first week of each semester, professors will notify each class of the attendance policy, emphasizing what constitutes excessive absences and the penalty, therefore. Students may appeal any absence-related decision of a professor to the department chair, to the dean of the professor's college or director of the division, and ultimately to the Vice President for Academic Affairs.

Attendance at all classes is expected and is SSU policy. Habitual late-comers or 3 absences may be refused to enter the classroom because this tends to disrupt everyone's concentration. Please show courtesy to your fellow classmates and in the event of an absence, you are responsible for all missed materials, assignments, and any additional announcements or schedule changes given in class. Class disruptions of any kinds (including coming late, leaving early, wandering during class, leaving all cellular phones and pagers ringing, conversing with your fellow students, etc) will not be tolerated and may result in your removal from the classroom and a lower final grade. Politeness will be greatly appreciated. Meeting with the instructor outside of office hours requires an appointment.

Academic Honesty:

Academic dishonesty, such as cheating and plagiarism; knowingly furnishing false information; forgery, alternations, or unauthorized use of University documents, records, identification, or property to gain an un-entitled advantage; taking or attempting to take, steal or otherwise procure in an unauthorized manner any material pertaining to the conduct of a class, including, but not limited to, tests, examinations, laboratory equipment and roll books; and selling, giving, lending or otherwise furnishing to any unauthorized person, material containing questions or answers to any examination scheduled to be given at a subsequent date in any course of study offered by the University. Plagiarism is prohibited. Themes, essays, term papers, tests and other similar requirements must be the work of the individuals submitting them. Direct quotations, paraphrased material, summaries of ideas of others must be appropriately acknowledged and attributed to their sources.

Athletes:

All official SSU athletes must provide to the instructor a copy of competition schedules for the entire season. Exams must be taken prior to competition related road trips.

Disability Accommodations and Personal Counseling on Campus

Savannah State University is committed to providing reasonable accommodations to students with documented disabilities, as required under federal law. Disabilities may include learning disabilities, ADD, psychological disorders, brain injury, Autism spectrum disorders, serious chronic medical illnesses, mobility impairment, vision or hearing loss or temporary injuries. SSU also provides free, professional, confidential, individual and group counseling, homeless services and referrals. The Counseling and Disability Centers are located in King Frazier 233, 8a.m. - 5p.m. 912 358 3129. Another resource for mental health emergencies is the GA Crisis and Access Line, available 24 hours a day at 1800 715 4225.