

MAED 4500 SYLLABUS
Curriculum and Methods for Teaching Secondary Mathematics

Department of Applied Mathematics & Physics
Valdosta State University

Guiding Principles (DEPOSITS)

(Adapted from the Georgia Systemic Teacher Education Program Accomplished Teacher Framework)

Dispositions Principle: Productive dispositions positively affect learners, professional growth, and the learning environment.

Equity Principle: All learners deserve high expectations and support.

Process Principle: Learning is a lifelong process of development and growth.

Ownership Principle: Professionals are committed to and assume responsibility for the future of their disciplines.

Support Principle: Successful engagement in the process of learning requires collaboration among multiple partners.

Impact Principle: Effective practice yields evidence of learning.

Technology Principle: Technology facilitates teaching, learning, community-building, and resource acquisition.

Standards Principle: Evidence-based standards systematically guide professional preparation and development.

InTASC Model Core Teacher Standards*

(To be used for all teacher preparation program courses. Identify those that apply specifically to this course.)

Standard #1: Learner Development. The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

Standard #2: Learning Differences. The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

Standard #3: Learning Environments. The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self motivation.

Standard #4: Content Knowledge. The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.

Standard #5: Application of Content. The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

Standard #6: Assessment. The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

Standard #7: Planning for Instruction. The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

Standard #8: Instructional Strategies. The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

Standard #9: Professional Learning and Ethical Practice. The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Standard #10: Leadership and Collaboration. The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

**Council of Chief State School Offices, (2013, April). InTASC model core teacher standards and learning progressions for teachers 1.0. Retrieved from http://www.ccsso.org/Documents/2013/2013_INTASC_Learning_Progressions_for_Teachers.pdf*

INSTRUCTOR

Name:

Office Number:

Telephone Number:

Email Address:

Office Hours:

Website:

COURSE DESCRIPTION

Hours: 3-1-3

Prerequisite: MAED 2999, MAED 3500 with a "C" or better, and Senior Standing. This is a checkpoint course.

A study of the characteristics of the high school mathematics learner and the development, implementation, and assessment of activities for grade 9-12 learners including the use of technology. Students will assess grade 9-12 learners and develop and implement appropriate curriculum and activities. Instructional methods for individual learners and whole-class strategies will be examined. A field experience with a minimum of 100 hours is required and integrated into this course.

These field experiences provide pre-service teachers with an understanding of designing instruction to facilitate mathematical learning for all students in the classroom. The university supervisor will assess the effectiveness of the teacher preparation student's teaching behaviors, and develop strategies to improve the teacher preparation student's instructional effectiveness.

REQUIRED TEXTBOOKS/RESOURCE MATERIALS

Sample Textbooks:

- Posamentier, A.S., Smith, B. S., & Stepelman, J. (2009). *Teaching Secondary Mathematics: Techniques and Enrichment Units*, 8th ed. Boston: Allyn & Bacon.
- Brahier, D.J. (2008). *Teaching secondary and middle school mathematics*, 3rd ed. Boston: Allyn & Bacon.
- Ornstein, A. C., Lasley II, T. J., & Mindes, G. (2005) *Secondary and Middle School Methods*. Boston: Pearson.
- Van de Walle, J., Karp, K., & Bay-Williams, J. (2009). *Elementary and middle school mathematics: Teaching developmentally*, 7th ed. Boston: Allyn & Bacon
- Bay-Williams, J., & Van de Walle, J. (2009). *Field experience guide for elementary and middle school mathematics: Teaching developmentally*, 7th ed. Boston: Allyn & Bacon
- Rubenstein, R., Beckmann, C., & Thompson, D. (2008). *Teaching and learning middle grades math*. Hoboken, NJ: Wiley.
- Johnson, A., & Norris, K. (2005). *Teaching today's mathematics in the middle grades*. Boston: Allyn & Bacon.
- LiveText Inc. (2004). *College LiveText edu solutions*. La Grange, IL: United Learning Inc.

Additional Sources:

- National Council of Teachers of Mathematics (2000). *Principles and standards for school mathematics*. Reston, VA: Authors.
- National Council of Teachers of Mathematics (2001). *Navigating through Algebra in Grades 9-12*. Reston, VA: Authors
- National Council of Teachers of Mathematics (2001). *Navigating through Geometry in Grades 9-12*. Reston, VA: Authors
- National Council of Teachers of Mathematics (2003). *Navigating through Data Analysis in Grades 9-12*. Reston, VA: Authors.
- National Council of Teachers of Mathematics (2004). *Navigating through Probability in Grades 9-12*. Reston, VA: Authors.
- National Council of Teachers of Mathematics (2001). *Navigating through Algebra in Grades 6-8*. Reston, VA: Authors
- National Council of Teachers of Mathematics (2002). *Navigating through Geometry in Grades 6-8*. Reston, VA: Authors
- National Council of Teachers of Mathematics (2003). *Navigating through Data Analysis in Grades 6-8*. Reston, VA: Authors.
- National Council of Teachers of Mathematics (2003). *Navigating through Probability in Grades 6-8*. Reston, VA: Authors.

Technology:

- Graphing Calculator
- Geogebra software/The Geometer's Sketchpad software
- Microsoft Excel

COURSE OBJECTIVES

The student will:

- (1) Demonstrate an understanding of secondary school students and how they learn mathematics. (InTASC S1, S2)

- (2) Demonstrate competency in planning activities that incorporate a broad understanding of mathematical learning outcomes. (InTASC S4, S5, S6, S7, S8)
- (3) Plan and implement instruction based on state standards and the National Council of Teachers of Mathematics Standards. (InTASC S4, S5, S6, S7)
- (4) Understand, choose, develop, and use effective means of assessing individual learner's performance and knowledge. (InTASC S4, S5, S6, S7)
- (5) Choose, develop and utilize appropriate curriculum and activities based on assessment of the individual learner. (CFS I, II, IV, V)
- (6) Choose, develop, and utilize inquiry-based, problem-centered activities. (InTASC S3, S7, S8, S7)
- (7) Evaluate, select, and implement instructional materials and resources, including technology, as appropriate. (InTASC S7, S8)
- (8) Become involved in appropriate professional organizations to deepen their knowledge of mathematics and maintain current knowledge of developments in mathematics education. (InTASC S9, S10)

COURSE ACTIVITIES/ASSIGNMENTS/REQUIREMENTS

The instructor will provide a syllabus to the students to address the requirements of the course, including attendance, in-class activities, out-of-class assignments, and student evaluation. A comprehensive final exam will be given at the time scheduled by the registrar. Students will be evaluated on the basis of written and oral communication skills in mathematics.

Required Assessments (to meet department, university, and accreditation requirements):

- Assessment of secondary mathematics learners' mathematical knowledge project(s)
- Development and implementation of lesson plans
- Demonstrate an impact on learning (implementing lesson plans, pre/post test to show growth)
- Comprehensive final exam
- Professional dispositions
- Additions to the electronic portfolio

Other assessments as determined by the instructor:

- Professional readings and reflective reading responses
- In-class participation and discussion
- Class assignments
- Quizzes
- Unit exams

Sample Description of Components:

Exams:

30%

There will be 3 exams given during the semester each counting worth 10% of your course average. The content of the exams comes from the material presented in the course through readings (text and additional readings), text exercises, assignments, in-class notes, and in-class activities.

Final Exam: 20%

A comprehensive final exam will be given at the time scheduled by the registrar.

Teaching /Implementing Lessons: 20%

Individually you will perform model lessons. The lessons will include an assessment component (pre-test and post-test). At least one lesson must include a technology component. Individually you will prepare and hand in a typed lesson plan that would permit someone else to do the same thing you were planning to do. Instructions should be written out for each activity and the complete set of questions, sentences, etc. should be included. Keep a copy for yourself, post a copy to your electronic portfolio, and turn one into instructor at the time of your lesson. You will be evaluated on how well your plan is organized and how well you implement your written lesson plan.

Professional Readings: 10%

You will select an article from a peer-reviewed journal about a topic appropriate for course objectives. You will complete an sQR (s=short summary of the article, Q=questions about article for class discussion, and R=reflection about article). You will also lead a small class discussion about the article you selected.

Professional Growth: 10%

You will attend a professional meeting. A one-page paper describing the activity and at least 2 people met will be turned in after the meeting.

Quizzes/Reading responses: 10%

You will have weekly quizzes and/or reading responses about the readings and/or class discussions.

STUDENT EVALUATION

Sample Grade Components:

Exam 1	10%
Exam 2	10%
Exam 3	10%
Final Exam	20%
Teaching/Implementing Lessons	20%
Professional Readings and Reflections	10%
Professional Growth	10%
<u>Quizzes/Reading Responses</u>	10%
TOTAL	100%