

Course Proposal: **Modify Course**

This proposal will change the following elements of the course.

Short Course Title, Course Description, Prerequisites

1. Course prefix and number: **MTE 565**
2. Effective Term/Year: **FALL 2013**
3. CIP CODE/10 digit program code: **13131100 No Change**
4. Short Course Title: **Precalculus Mathematics**

Modified Short Course Title: **Seminar in Analytic Geometry and Functions**

5. What is the primary reason you are modifying this course?

This modified course description more accurately represents the course content and the function of the course in the proposed consolidated graduate major.

6. Enter course description exactly as it now appears in the general/graduate bulletin.

A combination of topics emphasizing concepts which are important in the study of calculus. Real and complex number systems; polynomial, rational, trigonometric, and transcendental functions; graphing in rectangular and polar coordinates using appropriate technology.

Enter modified course description exactly as it will appear in the general/graduate bulletin?

A combination of topics emphasizing concepts which are important in the study of calculus. Real and complex number systems; polynomial, rational, and transcendental functions; graphing in rectangular and polar coordinates using appropriate technology; conic sections. Special attention will be given to the implementation of these concepts into the middle and high school curricula.

7. Current Prerequisites:

Nine semester hours of mathematics and graduate standing

Modified Course Prerequisites:

MTE 555

8. College: **College of Science and Mathematics**
9. Department Teaching Course: **Mathematics and Statistics**

10a. Instruction Type: **Lecture No Change**

10b. Credit Hours: **No Change**

Current - Maximum: **3** Minimum: **3** Maximum Hours counted toward degree: **3**

Modified- Maximum: Minimum: Maximum Hours counted toward degree:

11a. Second Instruction Type: **ns**

11b. Second Credit Hours:

Current - Maximum: Minimum: Maximum Hours counted toward degree:

Modified- Maximum: Minimum: Maximum Hours counted toward degree:

12. Maximum contact hours each week fall semester: **No Change**

Lecture: **3** Lab: Other:

13. May this course be taken more than one time each semester: **No**

14. Grade Type: **Regular: A-F No Change**

15. Describe the place of the modified course within your current curriculum. Will it be elective or required? Part of a major or a minor? (Enter NA if no change is being made.)

We are proposing a consolidation of existing graduate majors, School Mathematics Teaching: Middle Level and School Mathematics Teaching: Secondary Level, into a single major in School Mathematics Teaching with a 24 credit hour core and emphases in middle or secondary levels. This course is currently required for both the middle level and secondary level majors and there is no change in the placement of the course. It is one of the 24 credit hour core courses required in the new consolidated major.

16. How does the modified course differ from similar courses being offered at Stephen F. Austin? (Enter NA if no change is being made.) **NA**

17. Syllabus: Course Learning Goals

List course objectives; describe what students who complete the course will know or be able to do. (Enter NA if no change is being made.) **NA**

18. Syllabus: Course Outline

List the topics that the modified course will cover and indicate the approximate proposed amount of time to be devoted to each, either by percent of course time or number of weeks. Please indicate which topics will be required in all sections of the course and which may vary. (Enter NA if no change is being made.) **NA**

19. Syllabus: Modified Textbook/Assigned Reading Materials for course.
See attached syllabus.

20. Any Other Information

Dept. Chair _____ Date: _____

College Curriculum Chair _____ Date: _____

College Dean _____ Date: _____

Grad Dean/Univ Curr Chair _____ Date: _____



MTE 565 – An Overview of Analytic Geometry Course Syllabus

Course Description: A combination of topics emphasizing concepts which are important in the study of calculus. Real and complex number systems; polynomial, rational, and transcendental functions; graphing in rectangular and polar coordinates using appropriate technology; conic sections. Special attention will be given to the implementation of these concepts into the middle and high school curricula.

Credit Hours: 3

Course Prerequisites: MTE 555

<u>Course Outline:</u>	<u>Approximate time spent</u>
• Real and Complex Numbers and the associated Field Properties	20%
• Functions and Graphing: <ul style="list-style-type: none">○ Polynomial Functions○ Rational Functions○ Logarithm and Exponential Functions○ Trigonometric Functions○ Lines, Circles, and Conic Sections○ Rectangular and Polar Coordinates	60%
• Connections to the secondary classroom	20%

Student Learning Outcomes (SLO): At the end of MTE 565, successful students will be able to:

1. Define the real and complex number systems and demonstrate an understanding of their properties. [PLO 1]
2. Correctly explain the field properties associated with the real and complex number systems and give examples and non-examples of each, including examples of secondary student misunderstanding. [PLO 1,3,5]
3. Define function and identify function properties (including domain, range, one-to-one, and onto) and provide examples and nonexamples that are appropriate and meaningful to the secondary classroom, including examples of common secondary student misunderstanding. [PLO 1,3,4]
4. Recognize basic functions (including polynomial, rational, logarithmic, exponential) algebraically and graphically, and identify appropriate real-world applications of each. [PLO 1,2]
5. Explain the use of the vertical and horizontal line tests to determine whether a graph represents a function or a one-to-one function, respectively. [PLO 1,3,5]
6. Explain when a function has an inverse and what steps have to occur in order to obtain an inverse for a function, and describe the value of the inverse. [PLO 1,3,5]
7. Define and identify linear functions including common pitfalls for secondary students. [PLO 1,3]
8. Define and identify the conic sections: circles, ellipses, parabolas, and hyperbolas. [PLO 1]
9. Convert between rectangular and polar coordinates. [PLO 1]
10. Solve problems involving various functions with and without technology. [PLO 1,2]
11. Make appropriate connections from the content of MTE 565 to the middle and secondary mathematics classroom. [PLO 1,2,3,4,5,6]

Program Learning Outcomes (PLO): Students graduating from SFASU with an M.S. degree and a major in school mathematics teaching will demonstrate:

1. Conceptual understanding and procedural fluency necessary for teaching the core areas of school mathematics (number/operation (N&O), patterns/algebra (P&A), geometry/measurement (G&M), and probability/statistics (P&S)). [*Concepts & Skills*]
2. Competency in using various mathematical tools (including technology) to formulate, represent, and solve problems. (N&O tools, P&A tools, G&M tools, and P&S tools applied to basic and multi-step computational and application problems) [*Problem Solving*]
3. The ability to use mathematical reasoning to develop conjectures, design sound arguments, and analyze student thinking. (pattern recognition/conjecture development, examples/non-examples, deductive/inductive reasoning, argument analysis) [*Critical Thinking*]
4. An understanding of the development and connectedness of mathematical ideas – historically, between content areas, and across grade levels. [*Connections*]
5. Effective communication of mathematical ideas in oral, visual, and written forms. [*Communication*]
6. Leadership skills in facilitating collaboration, mentoring teachers, making appropriate instructional decisions, and delivering professional development. [*Leadership*]

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