Course Proposal: Modify Course

This proposal will change the following elements of the course. **Course Description, Prerequisites**

- 1. Course prefix and number: MTE 560
- 2. Effective Term/Year: FALL 2013
- 3. CIP CODE/10 digit program code: 13131100 No Change
- 4. Short Course Title: Concepts of Geometry with Historical Perspectives

Modified Short Course Title:

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

This modified course description and title 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.

Survey of historical foundations of geometric topics with an emphasis on trigonometry, geometry (Euclidean and non-Euclidean), and plane analytic geometry, including connections to elementary and middle school mathematics.

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

An in-depth exploration of Euclidean Geometry. Includes the historical development of geometry concepts through present day mathematics. Emphasis is placed on the communication of mathematics and appropriate use of notation. In addition, special attention will be given to the implementation of concepts in the middle and high school curricula.

7. Current Prerequisites:

MTE 550, 552, and 554

Modified Course Prerequisites:

MTE 550 or equivalent, and MTE 570

8. College: College of Science and Mathematics

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: |



Department of Mathematics and Statistics

MTE 560 – Concepts of Geometry with Historical Perspectives Course Syllabus

Course Description: An in-depth exploration of Euclidean Geometry. Includes the historical development of geometry concepts through present day mathematics. Emphasis is placed on the communication of mathematics and appropriate use of notation. In addition, special attention will be given to the implementation of concepts in the middle and high school curricula.

Credit hours: 3

Course Prerequisites and Corequisites: MTE 550 or equivalent, and MTE 570

Course Outline:

- Topics in Geometry
 - Illustrate geometry from several perspectives, including the use of coordinate systems, transformations, and vectors.
 - Relate geometry to algebra by representing transformations as matrices and use this relationship to solve problems.
 - Illustrate and analyze axiomatic systems and their components, such as undefined terms, defined terms, theorems, examples, and counter-examples for Euclidean and non-Euclidean geometries.
 - Relate geometry and algebra by representing conic sections using rectangular and polar coordinates.
 - Investigate two- and three- dimensional figures and develop proofs of common theorems.
 - Make appropriate connections between the concepts of geometry and the middle and high school curricula.

• Historical Perspectives to the classroom

- Communicate the vertical alignment of geometry and algebra and how these strands of mathematics developed historically;
- Use knowledge of the historical development of mathematical ideas to make connections to other disciplines such as art, music, science, social science, and business.
- Make appropriate connections between the historical developments of mathematical concepts and the middle and high school curricula.

<u>Student Learning Outcomes (SLO)</u>: At the end of MTE 560, the successful student will be able to:

- 1. Justify basic geometric constructions using a variety of tools, including dynamic geometry software such as Geometer's Sketchpad. [PLO: 1, 2, 4, 5]
- 2. Develop and prove conjectures concerning basic geometric relationships within the axiomatic structure of Euclidean geometry. [PLO: 1, 3, 4, 5]
- 3. Demonstrate an understanding of the significance of the parallel postulate on the development of Euclidean and non-Euclidean geometries. [PLO: 1, 3, 4]
- 4. Develop proofs for common geometric theorems. [PLO: 1, 2, 3, 5]
- 5. Communicate orally and in written form an understanding of the connections among geometric, graphic, numeric, and algebraic solutions to problems. [PLO: 1, 2, 4, 5, 6]
- 6. Make appropriate connections from MTE 560 to the middle and high school level mathematics classroom. [PLO: 1, 2, 3, 4, 5, 6]

Approximate time spent

80%

20%

<u>Program Learning Outcomes (PLO)</u>: 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]
- Competences 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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