



MATH 345 – Mathematics for the Secondary School Teacher Course Syllabus

Course Description: A review of the major topics taught in secondary schools. Historical perspectives of mathematics, technology in the classroom, inductive versus deductive reasoning, careers in mathematics, and interrelationships among various branches of mathematics.

Credit hours: 3

Course Prerequisites and Corequisites: MTH 220, and MTH 451 or concurrent enrollment in MTH 451

Course Outline:

Approximate time spent

- **Professional requirements and responsibilities** 10%
 - Mastery exam administered during class to determine level of proficiency in mathematics content and pedagogy.
 - Discussion of mathematics classroom requirements and responsibilities as delineated within the Texas Essential Knowledge and Skills and the NCTM Principles and Standards for School Mathematics.
- **Mathematics content and historical connections** 30%
 - Grades 8-12 and SBEC beginning teacher standards addressed with special emphasis on topics of interest and concern as determined by the level of proficiency on the mastery exam.
 - Historical development of mathematical ideas with appropriate classroom connections.
- **Case studies and student presentations** 60%
 - Student presentations on assigned content topics.
 - Case study investigations with interactive class discussions.

Student Learning Outcomes (SLO): At the end of MTH 345, a student who has studied and learned the material should be able to:

1. Understand the role of definitions and language in mathematics. [PLO: 1]
2. Analyze typical questions of high school mathematics from a deeper level. [PLO: 3,5]
3. Make connections between different strands of mathematics. [PLO: 1]
4. Make connections between the mathematics of high school and the advanced mathematics of the undergraduate college curriculum. [PLO: 1,2]
5. Discuss historical contexts in which key mathematical concepts arose and how they have developed over time. [PLO: 5]
6. Demonstrate alternative approaches to solving mathematical problems, including those with and without calculator and computer technology. [PLO: 4]
7. Apply mathematics in a variety of settings. [PLO: 3,4]
8. Demonstrate an understanding of both national and state standards for high school students and teachers. [PLO: 5]
9. Demonstrate an understanding of what is required of them both academically and professionally. [PLO: 2]

Program Learning Outcomes (PLO):

Students graduating from SFASU with a B.S. degree and a major in mathematics will:

1. Demonstrate comprehension of core mathematical concepts. [**Concepts**]
(notion of theorem, mathematical proof, logical argument)
2. Execute mathematical procedures accurately, appropriately, and efficiently. [**Skills**]
(calculus, algebra, routine, nonroutine, applied)
3. Apply principles of logic to develop and analyze conjectures and proofs. [**Logical Reasoning**]
(quantifiers, breaking down mathematical statements, counterexamples)
4. Demonstrate competence in using various mathematical tools, including technology, to formulate, represent, and solve problems. [**Problem Solving**]
(calculus tools, algebra tools, applied tools, nonstandard problem solving)
5. Demonstrate proficiency in communicating mathematics in a format appropriate to expected audiences. [**Communication**]
(written, visual, oral)