MATH 3850/8855

HISTORY OF MATHEMATICS

Course Description:

An overview of the historical development of mathematical concepts and methods. Brief biographies of major mathematicians, descriptions of the cultural context of selected major advances, and examples of the solution of problems using the knowledge and methods appropriate for each time period will be included. **3 credits**

Prerequisites:

Students who enroll in this course should have competed MATH 1970, Calculus III, and MATH 2230, Introduction to Abstract Mathematics, in order to have the minimum amount of mathematical background needed to appreciate the mathematical content of the course.

Overview of Content and Purpose of the Course:

This course is currently required for all secondary education majors preparing to teach mathematics. In recent years, educators have concluded that teachers and students have a better understanding and appreciation of mathematics when they know something about the origin of mathematical ideas and about the personalities of the mathematicians who developed them. The course will also provide those mathematics majors who select this course as an elective with a better understanding of their discipline and how the ideas presented in their other course work are related to the discipline as a whole.

At the completion of this course, the student

(a) shall understand the general historical, intellectual, and social environment in which some of the major ideas of present-day mathematics developed;

(b) shall understand the significance of the major breakthroughs in mathematical thought and some of the unsolved problems in mathematics;

(c) shall have studied the biographies, personalities, and contributions of a selected group of great mathematicians;

(d) shall have acquired the ability to teach or present mathematical ideas to students or to other groups in such a way as to enhance understanding and appreciation for the contributions of mathematics to human intellectual development; and

(e) shall have been introduced to the publications and organizations which can connect them to the world-wide community of mathematics teachers and scholars.

Anticipated Audience/Demand:

This course is primarily intended for students in secondary education preparing to teach mathematics and for Graduate students in the Master of Arts for Teachers of Mathematics program. It is also expected that a small number of mathematics majors may choose the course as an elective.

Major Topics:

In teaching this course, the instructor should be given some latitude in the selection of the general organization and emphasis to be used. For example, a strictly chronological order could be used, following certain important themes through the centuries to their current status, or several important themes could be selected and developed separately in a chronological manner. All organizational structures, however, must contain the following basic elements:

A. A review of the chronological history of human culture and intellectual development, with particular emphasis on those periods in which the greatest advances in mathematics occurred.

B. A survey of how human understanding of several selected mathematical problems developed to its present level. Examples of such problems are mathematical calculation; axiomatic geometry; number theory; calculus, differential and integral; set theory; and mathematical logic.

C. Biographies of selected mathematicians which provide insight into the issues and the mechanisms used by mathematicians to resolve those issues throughout history.

Methods:

The class will be presented by lecture; class discussion and questions; and problem assignments. The latter will often involve using the methods appropriate to specific time periods in the development of mathematics. Students will be expected to attend class, to submit all assignments as directed by the instructor, and to participate in class discussion.

Textbook:

No text required.

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