COURSE SYLLABUS

MATH2413 - CALCULUS WITH ANALYTIC GEOMETRY

CATALOG DESCRIPTION:

This course will include limits, continuity, derivatives, differentiation rules and rates of change, implicit differentiation and related rates, applications of derivatives, applications including analytic geometry-straight lines and conic sections, antiderivatives, definite and indefinite integration, Fundamental Theorem of Calculus, integration by substitution, and numerical integration. A strong algebra and trigonometry background is necessary.

Prerequisite(s): None.

Semester Credit Hours: 4

Core Curriculum: State Criteria

BASIC INTELLECTUAL COMPETENCIES (THE FOLLOWING REFLECT THE STATE-MANDATED COMPETENCIES TAUGHT IN THIS COURSE.):

Reading
Writing
Listening
Critical Thinking
Computer Literacy

PERSPECTIVES (THE FOLLOWING REFLECT THE STATE-MANDATED PERSPECTIVES TAUGHT IN THIS COURSE):

a. Use logical reasoning in problem solving.
b. Exemplary Objectives (The following reflect the state-mandated exemplary objectives taught in this course.):
c. Mathematics: The objective of the mathematics component of the core curriculum is to develop a quantitatively literate college graduate. Every college graduate should be able to apply basic mathematical tools in the solution of real-world problems.
d. To apply arithmetic, algebraic, geometric, higher-order thinking and statistical methods to modeling and solving real-world situations.
e. To represent and evaluate basic mathematical information verbally, numerically, graphically, and symbolically.
f. To expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments.

g. To use appropriate technology to enhance mathematical thinking and understand and to solve mathematical problems and judge reasonableness of the results.

h. To interpret mathematical models such as formulas, graphs, tables and schematics, and draw inferences from them.

i. To develop the limitations of mathematical and statistical models.

j. To develop the view that mathematics is an evolving discipline interrelated with human culture, and understand its connections to other disciplines.

GENERAL COURSE OBJECTIVES:

Successful completion of this course will promote the general student learning outcomes listed below. The student will be able:

a. To apply problem-solving skills through solving application problems.

b. To demonstrate arithmetic and algebraic manipulation skills.

c. To read and understand scientific and mathematical literature by utilizing proper vocabulary and methodology.

d. To construct appropriate mathematical modules to solve applications.

e. To interpret and apply mathematical concepts.

f. To use multiple approaches - physical, symbolic, graphical, and verbal - to solve application problems.

SPECIFIC COURSE OBJECTIVES:

Upon successful completion of the course, the student will be able:

a. To apply the concepts of limits and continuity to functions.

b. To be able to find derivatives by evaluating limits and by derived formulas.

c. To be able to show how to use derivatives to find maximum and minimum values of functions.

d. To be able to predict and analyze the shapes of graphs.

e. To draw conclusions about the behavior of functions that satisfies differential equations.

f. To analyze the Mean Value Theorem and its corollaries.

g. To describe how functions are changing at a given instant and over a given interval.

h. To discover the relationship between differential and integral calculus in the Fundamental Theorem of Calculus.

i. To identify transcendental functions.

j. To apply the rules of differentiation and integration to transcendental functions.

Students will be required to do the following:

Find limits graphically and numerically.

Evaluate limits analytically.

Determine continuity and one-sided limits.

Use L'Hopital's Rule to evaluate limits involving indeterminate forms.

Determine infinite limits.

Determine the derivative using the limit definition.

Determine the derivative using the the rules for differentiation.

Solve application problems involving related rates.

Use the first and second derivatives to sketch curves.

Solve application problems involving maxima and minima.

Determine anti-derivatives and indefinite integrals.

Determine area using Riemann sums.

Evaluate definite integrals using the Fundamental Theorem of Calculus.

Integrate by substitution and numerical methods.

Determine the derivative and integrate logarithmic, exponential and other transdental functions.

METHODS OF INSTRUCTION/COURSE FORMAT/DELIVERY:

Faculty may choose from but are not limited to the following methods of Instruction: lecture, discussion, Internet, video, television, demonstrations, field trips, collaboration, and readings.

ASSESSMENT:

Faculty may assign both in- and out-of-class activities to evaluate students' knowledge and abilities. Faculty may choose from the following methods:

Attendance
Book reviews
Class preparedness and participation
Collaborative learning projects

Compositions
Exams/tests/quizzes
Homework
Internet
Journals
Library assignments
Readings
Research papers
Scientific observations
Student-teacher conference
Written assignments

COURSE GRADE:

Students' final grades are determined by:

A	**90**	**+**	
B	**80**	**-**	**89**
C	**70**	**-**	**79**
D	**60**	**-**	**69**
F	**0**	**-**	**59**

OTHER:

Class Absences may cause in lower grades.

Academic Dishonesty may result in failing grades. Student found of academic dishonesty will be dropped from the class.