MATH 1220

Division: Natural Science and Mathematics
Department: Mathematics
Course: MATH 1220
Title: Calculus II
Catalog Description:

This course is a continuation of the study of calculus. Topics include differentiation and integration of transcendental functions, techniques of integration and applications, conic sections and polar coordinates, infinite sequences and series, and vectors.

General Education Requirements: N/A
Semesters Offered: Fall, Spring
Credit/Time Requirement: Credit: 4; Lecture: 4; Lab: 0
Clock/Hour Requirements: 0
Offered for Non-Credit: No
Prerequisites: Calculus I

Justification:

Calculus is a required topic in a wide variety of major programs including, but not limited to, Mathematics and Mathematics Education, Engineering, Premed (all areas), Physics, Chemistry, and other science intensive areas.

Student Learning Outcomes:

Upon successful completion of this course, the student will:

- Understand and solve problems involving derivatives and integrals of transcendental functions
- Understand and solve integration problems using a variety of methods
- Apply techniques of integration to solve real world problems
- Understand and solve calculus problems involving conic sections and polar coordinates
- Understand and solve problems involving infinte sequences and series, including determining convergence
- Understand and solve problems involving vectors

Content:

This course will include:

- Integrals and transcendental functions
- Techniques of integration
    - Integraion formulas and integral tables
    - Integration by parts
    - Integration by partial fractions
    - Trigonometric substitutions

        - Numerical integrals
        - Improper integrals
    - Applications of integration
    - Conic sections and polar coordinates
    - Infinite sequences and series
        - Convergence tests
        - Power series (including Taylor Series) and applications
    - Introduction to vectors (2D and 3D)

General Education Outcomes:

6) Apply computational skills to a variety of contexts.
In this course students are taught how to perform quantitative calculations. Homework exercises and exam problems assess the competency of student skills in a variety of theoretical and applied situations.

Key Performance Indicators:
Student learning will be evaluated primarily through daily homework assignments, quizzes, and periodic examinations. Additional assessment may be achieved through other activities such as group or class activities, classroom participation, etc.

The point/percentage breakdown for computing the final grade will be:
Exams (pretest, midterms, and final): 50 - 80%
Homework: 10 - 30%
Quizzes: 0 - 10%
Other activities: 0 - 10%

Representative Text and/or Supplies:
Weir, Hass, and Giordano, *Thomas' Calculus: Early Transcendentals*, current edition, Pearson / Addison Wesley
or
Varberg, *Calculus*, current edition, Prentice Hall

Optimum Class Size: 20
Maximum Class Size: 36

Signatures:

I hereby submit this course syllabus:

Kari Arnoldsen, PhD, Professor

I hereby find this course consistent with the goals and resources of the Mathematics Department:

Kari Arnoldsen, PhD, Professor, Chair

I hereby find this course consistent with the goals and resources of the Natural Science and Mathematics Division:

Dan Black, EdD, Associate Professor, Dean

I have discussed the need for library resources related to this class with the person submitting the syllabus:

Lynn Anderson, MLIS, Technical Services Librarian (Main Campus)

Michelle Olsen, MLS, Campus Librarian (Richfield Campus)