Mathematics 212 (3 Units): Calculus II, and the corequisite Mathematics 222 (3 Units): Laboratory Experience I

Instructor: Marc Thomas

Catalog Description: Introduction to the integral calculus of elementary functions. The Fundamental Theorem of Calculus; techniques of integration; applications of integration; improper integrals; introduction to differential equations. This course makes use of graphing calculators but computer algebra systems are handled in the corequisite course Mathematics 222 (3 Units).

Prerequisites: A mark of C- or better in Mathematics 211 (or an equivalent first quarter Calculus course).


Additional References: None.

Course Goals: This course is the second quarter of a four quarter sequence in the Differential and Integral Calculus. Knowledge of the principles of Calculus and the ability to apply these principles in order to solve applied problems is fundamental to study in several fields: Chemistry, Computer Science, Economics, Engineering, Geology, Mathematics, and Physics.

Lab work will parallel the lecture and is handled by (the separately numbered) Mathematics 222, but will include heavy use of the mathematical language and symbolic manipulator Maple V in one of the Computer Lab rooms (downstairs in the Library). This package will do both symbolic and numerical computations for you, and such a package is essential for doing many real-world problems. The computer package cannot, however, be used blindly; you need to understand the concepts and principles that the machine is using to produce the answers. *You also need to recognize when the machine has produced an answer which is unreasonable.*

We will cover the following topics in the text:

2. Techniques of Integration
3. Applications of Integrals
4. Polar Coordinates
5. Differential Equations.

Grading: In Mathematics 212 Two midterms will be given, each worth 30%. I do not give make-up midterms; for an excused absence I count the other grades proportionately higher. One final exam, comprehensive but emphasizing the later material will be given. This is mandatory and is worth 30%. Homework is worth 10%. Since the desire is that the homework be a learning experience, these assignments will be graded on a good/satisfactory/unsatisfactory basis.

The grade in Mathematics 222 will be based 50% on the grades assigned for each Laboratory Module with a final exam (on the computer) which will be worth 50%. In the grading of borderline cases consideration will be given to (i) appreciable improvement over the course of the quarter, (ii) effort and attendance. We are required now to inform all students that the last day to drop any course for a serious and compelling reason is May 15, 2000.