

Department: MATHEMATICAL SCIENCES

Semester hours: 4

Course Title and Number: MATH 230 CALCULUS II

Course Description: Continuation of Math 229 Calculus I. Includes applications of the definite integral, transcendental functions, methods of integration, improper integrals, sequences and series.

PRQ: MATH 229 with a grade of C or better.

Course Objectives:

- To understand and connect concepts of the calculus with real world problems and other scientific disciplines.
- To value mathematics and develop an ability to communicate mathematics, both in writing and orally.
- To develop mathematical reasoning, and an ability to solve problems.
- To attain computational facility in integral calculus, and sequences and series.

(More detailed objectives appear in the Assessment Appendix.)

Content:

- Applications of the definite integral: Finding volumes by the methods of slicing and of cylindrical shells; arc length and surface area of a solid of revolution; the average value of a function.
- Transcendental functions: Inverse functions; derivatives of the inverse trigonometric functions; the natural and general logarithm and exponential functions.
- Methods of integration: Basic formulas, integration by parts, integration of trigonometric expressions, trigonometric substitutions, partial fractions, integrals involving quadratic expressions; approximate integration; improper integrals; L'Hospital's rule.
- Sequences and series: Convergence tests (comparison, integral, ratio and root tests); alternating series; power series; Taylor and MacLaurin series; calculations with series; Taylor's formula with remainder.

Course Requirements: Written explanation of problem solutions and writing involving concepts. Discussion and presentation involving concepts and problem solutions in class settings. Competency in the computational aspects of the course. Solutions of problems representing applications of the calculus to other disciplines.

Assessment Instruments: Judgment on student involvement and depth of contributions in class discussion. Homework problem and writing assignments. Short quizzes. Hour examinations. Final examination.

Current Textbook: Stewart, **Calculus** 8th Edition, Cengage Learning, 2016.