COLLEGEWIDE COURSE OUTLINE OF RECORD

MATH 212 CALCULUS II

COURSE TITLE: Calculus II
COURSE NUMBER: MATH 212
PREREQUISITES: MATH 211 Calculus I
SCHOOL: Liberal Arts and Sciences
PROGRAM: Liberal Arts
CREDIT HOURS: 4
CONTACT HOURS: Lecture: 4
DATE OF LAST REVISION: Fall, 2011
EFFECTIVE DATE OF THIS REVISION: Fall, 2016

CATALOG DESCRIPTION: Studies the techniques of substitution, integration by parts, trigonometric integrals, partial fractions and trigonometric substitution to evaluate integrals. Applies Simpson's rule and other elementary numerical quadrature methods to approximate integrals. Applies the integral calculus to find arc lengths, areas of surfaces of revolution and to solve force and work problems. Applies the direction field technique to find graphical solutions of differential equations. Applies Euler's technique to approximate the solution of initial value problems. Studies techniques of solving separable differential equations. Studies techniques to determine convergence of sequences and series. Studies techniques to determine the power series representation of functions.

MAJOR COURSE LEARNING OBJECTIVES: Upon successful completion of this course the student will be expected to:

1. Evaluate integrals by the method of substitution.
2. Approximate integrals by Simpson's rule and by other elementary numerical quadrature methods.
3. Evaluate integrals using integration by parts.
4. Evaluate trigonometric integrals.
5. Evaluate integrals of rational functions by the partial fractions method.
6. Evaluate integrals using trigonometric substitution.
7. Apply the integral calculus to find arc length and the area of a surface of revolution.
8. Apply the integral calculus to solve force and work problems.
9. Sketch solution curves of differential equations using the direction field method.
10. Find numerical solutions of initial value problems using Euler's method.
11. Solve separable differential equation
12. Determine whether a sequence converges by using the limit laws, the substitution. law, the squeeze law, L'Hôpital's rule or the bounded monotone convergence property.
13. Determine whether a series converges by approximating the partial sums, or by using comparison tests, the integral test, the alternating series test, the ratio test or the root test.
14. Determine whether a series is absolutely convergent, conditionally convergent or divergent.

15. Find the Taylor polynomial with remainder, the Maclaurin series and the Taylor series of a function.
16. Apply the ratio test to determine the interval of convergence of a power series.
17. Use termwise differentiation and integration to find the power series representation of a function.

COURSE CONTENT: Topical areas of study include --

Integration by substitution	Graphical solution of differential equations
Integration by parts	Approximate solution of differential equations
Trigonometric integrals	Separable differential equations
Integration of rational functions	Convergence of sequences
Approximating integrals	Convergence of series
Arc length	Taylor and Maclaurin series
Area of a surface of revolution	Representation by power series
Work and force problems	

CURRENT STATEWIDE GRADING SCALE

A   90 – 100
B   80 – 89
C   70 – 79
D   60 – 69
F   0 – 59

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