COURSE OUTLINE: OEL873 - CALCULUS II

Prepared: Fred MacWilliam
Approved: Lori Crosson, Director, E-Learning and Continuing Education

Course Code: Title	OEL873: CALCULUS II
Program Number: Name	
Department:	DISTANCE EDUCATION
Semesters/Terms:	20S, 20F, 21W
Course Description:	This advanced course in calculus contains some special methods of integration, Maclaurin, Taylor and Fourier series, various types of first and second order differential equations, an introduction to Laplace transforms, and applications to the mechanical, electrical/electronic technologies.
Total Credits:	4
Hours/Week:	4
Total Hours:	64
Prerequisites:	OEL847
Corequisites:	There are no co-requisites for this course.
Course Evaluation:	Passing Grade: 50%, D
Books and Required Resources:	Basic Technical Mathematics with Calculus by Allyn J. Washington, Michelle Boue Publisher: Addison Wesley Edition: 10 ISBN: 013400535X

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
Examine methods of Integration	-Integrate any type of algebraic or transcendental function using the general power formula for integration. -Find integrals of some types of expressions using a short table of integrals. -Find integrals of some expressions leading to a natural logarithm form using integration tables. -Evaluate integrals of some exponential expressions using a table of integrals. -Evaluate integrals of some trigonometric functions using a table of integrals. -Find integrals of some other types of trigonometric functions using integration tables. -Find integrals of some algebraic functions leading to inverse trigonometric functions using integration tables. -Find integrals of expressions requiring the use of the integration by parts formula. Some of these integrals are also found in integration tables. -Find integrals of expressions requiring a trigonometric substitution. Some of these integrals are also found in integration tables.

Course Outcome 2	Learning Objectives for Course Outcome 2
Examine Techniques of Integration	-Find a Fourier series for some types of periodic waveforms. -Expand a function using a Taylor series and then compute numerical values with this series. -Compute numerical values using a Maclaurin series. -Find a Maclaurin series for a function using a known Maclaurin series, by substitution, integration or differentiation, multiplication or division. -Expand a function using a Maclaurin series. -Recognize the difference between convergent and divergent series.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
Examine the Expansion of Functions in Series	-Identify a first order differential equation, and check a given solution to a differential equation. -Solve a first order differential equation by separating variables before integration. -Solve a first order differential equation by rearranging to isolate some form of integrable combination. -Find a solution (general or particular) for linear first order differential equations. -Solve some types of word problems involving differential equations.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
Examine Differential Equations	-Identify a higher order differential equation, and solve any type requiring direct integration. -Solve homogeneous differential equations where the auxiliary equation has unequal real roots. -Solve homogeneous differential equations where the auxiliary equation has equal (repeated) or complex roots. -Solve non-homogeneous differential equations combining a complementary and particular solution. -Solve some types of word problems involving higher order differential equations. -Find Laplace transforms of algebraic and transcendental functions and derivatives. -Use Laplace transforms to solve some types of differential equations.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Final exam	52%
Online tests 4	48%

Date: March 9, 2020

Addendum: Please refer to the course outline addendum on the Learning Management System for further information.