COURSE OUTLINE: MTH551 - CALCULUS I

Prepared: Mathematics Department

Approved: Sherri Smith, Chair, Natural Environment, Business, Design and Culinary

Course Code: Title	MTH551: CALCULUS I FOR TECHNOLOGY
Program Number: Name	4127: ELECTRICAL TN-TRADES
Department:	MATHEMATICS
Semesters/Terms:	20W
Course Description:	The basic concepts of calculus are introduced through an emphasis on applications and examples. Topics include limits, simple derivatives, derivatives of trigonometric and logarithmic functions, applications of derivatives, curve sketching, integration and applications of integration.
Total Credits:	4
Hours/Week:	4
Total Hours:	60
Prerequisites:	MTH143
Corequisites:	There are no co-requisites for this course.
Substitutes:	OEL780, OEL847
This course is a pre-requisite for:	MCH607, MTH577
Essential Employability Skills (EES) addressed in this course:	EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 10 Manage the use of time and other resources to complete projects.
Course Evaluation:	Passing Grade: 50%, D
Books and Required Resources:	Basic Technical Mathematics with Calculus by Washington/Boue Publisher: Pearson Edition: 10 ISBN: 9780134289915 Calculator - Sharp EL-520XTB (available in the bookstore)

Course Outcomes and Learning Objectives:	**Course Outcome 1**	**Learning Objectives for Course Outcome 1**
	1. Understanding Derivatives	1.1 Evaluate limits of algebraic functions. 1.2 Approximate the slope of a tangent to a curve. 1.3 Find the derivative of an algebraic function using the delta method. 1.4 Find instantaneous rates of change of a function using derivatives. 1.5 Find the derivative of a polynomial using a rule.

Course Outcome	Learning Objectives
	1.6 Find derivatives of other algebraic functions (products and quotients) using rules for differentiation. 1.7 Find the derivative of a power of a function - Chain rule. 1.8 Find the derivative of an implicit function. 1.9 Find higher derivatives of algebraic functions.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Applications using Differentiation	2.1 Find slopes and equations of tangent and normal lines. 2.2 Compute velocities and accelerations for curvilinear motion. 2.3 Solve related rate problems. 2.4 Make graphs of non-linear functions using derivatives. 2.5 Make graphs of discontinuous functions using derivatives, asymptotes, intercepts. 2.6 Solve applied maximum-minimum problems.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Understanding Integration	3.1 Use differentials to compute small change in a function. 3.2 Find an anti-derivative using derivative rules. 3.3 Use the basic rule for integration of algebraic functions. 3.4 Determine approximate areas under curves from graphs. 3.5 Determine exact areas under curves by integration - the fundamental theorem of integral calculus. 3.6 Evaluate other algebraic definite integrals.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Applications using Integration	4.1 Solve problems involving distance-velocity-acceleration, current-voltage-charge using integration. 4.2 Find areas (between two curves) using horizontal and vertical elements and definite integrals. 4.3 Find the volume of a solid of revolution using the disk or shell method.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. The Differentiation of Transcendental Functions	5.1 Find derivatives of expressions containing sine or cosine functions. 5.2 Find derivatives of other trigonometric functions. 5.3 Find derivatives of inverse trigonometric functions 5.4 Solve worded problems which involve trigonometric functions. 5.5 Find derivatives of logarithmic functions - and constant base. 5.6 Find derivatives of exponential functions - any constant base. 5.7 Solve worded problems involving logarithmic of exponential functions.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments/Quizzes	20%
Tests	80%

Date: June 19, 2019

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

information.