

6/3/2023

Differential Mathematics

EET1104

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Material Covered	
Week 1:	<ul style="list-style-type: none"> • Introduction to Differential Calculus. • Limits and Continuity. • Differentiation Rules: Power Rule, Product Rule, Quotient Rule, Chain Rule.
Week 2:	<ul style="list-style-type: none"> • Derivatives of Trigonometric and Exponential Functions • Derivatives of Logarithmic and Inverse Trigonometric Functions • Implicit Differentiation
Week 3:	<ul style="list-style-type: none"> • Related Rates • Optimization Problems in Engineering • Curve Sketching: Critical Points, Inflection Points, Concavity
Week 4:	<ul style="list-style-type: none"> • L'Hôpital's Rule and Indeterminate Forms • Linear Approximation and Differentials
Week 5:	<ul style="list-style-type: none"> • Applications of Differentiation in Engineering: Rates of Change, Velocity, Acceleration • Motion Problems: Position, Velocity, and Acceleration Functions
Week 6:	<ul style="list-style-type: none"> • Optimization of Engineering Systems: Maximum and Minimum Problems • Optimization with Constraints
Week 7:	<ul style="list-style-type: none"> • Applications of Differentiation in Engineering: Marginal Analysis, Cost and Revenue Optimization • Linearization and Error Analysis
Week 8:	<ul style="list-style-type: none"> • Implicit Differentiation and Higher Derivatives • Related Rates with Engineering Applications
Week 9:	<ul style="list-style-type: none"> • Transcendental Functions: Derivatives of Exponential and Logarithmic Functions • Applications of Transcendental Functions in Engineering
Week 10:	<ul style="list-style-type: none"> • Review of Differentiation Techniques • Higher Derivatives and Acceleration in Engineering
Week 11:	<ul style="list-style-type: none"> • Taylor Series Expansion and Applications • Linear Approximation and Estimation in Engineering
Week 12:	<ul style="list-style-type: none"> • Introduction to Differential Equations • First-Order Differential Equations: Separable Equations, Linear Equations
Week 13:	<ul style="list-style-type: none"> • Applications of Differential Equations in Engineering: Growth and Decay, RC Circuits
Week 14:	<ul style="list-style-type: none"> • Higher-Order Differential Equations and Engineering Applications • Spring-Mass Systems: Modeling and Analysis
Week 15:	<ul style="list-style-type: none"> • Systems of Differential Equations in Engineering: Electrical Circuits, Control Systems • Phase Plane Analysis: Stability and Classification • Review and Exam Preparation
Week 16	<ul style="list-style-type: none"> • Preparatory week before the final Exam