

LESSON PLAN B.TECH-II SEMESTER APPLIED MATHEMATICS-II KUK

Name of the Faculty : Dr. Sushil Kr. Sinha
Discipline : CSE, ME, EEE
Semester : B.Tech-II
Subject : Applied Mathematics-II (AS-104N)
Lesson Plan Duration : 15 weeks (from January-2018 to April-2018)
Work Load: (Lecture + Tutorial) per week (in hours): Lecture-04, Tutorial-01

Week	Lecture Day	Theory Topic	Tutorial Topic
Unit-I [Theory of Equations]			
1st	1 st	Introduction of theory of equation	Revision of relation between the roots
	2 nd	Polynomial, General equation, Degree of an equation	
	3 rd	Relation between roots and Coefficients.	
	4 th	Important theorem	
2 nd	1 st	Synthetic Division Method	Synthetic Division Method
	2 nd	Fundamental theorem of algebra	
	3 rd	Reciprocal Equations.	
	4 th	Transformation of equations.	
3 rd	1 st	Beta function.	Relation Between the Beta Gamma function
	2 nd	Gamma functions	
	3 rd	Relation Between the Beta & Gamma function	
	4 th	Dirichlet's Integral	
4 th	1 st	Dirichlet's Integral and its applications	Leibnitz Rule for Differentiation under the Integral sign.
	2 nd	Leibnitz Rule for Differentiation under the Integral sign.	
	3 rd	Leibnitz Rule: When limits of integration are independent of parameter α	
	4 th	Leibnitz Rule: When limits of integration are dependent of parameter α	
Unit-II [Laplace Transforms and its applications]			
5 th	1 st	Laplace transforms.	Laplace transforms. Transform of elementary functions.
	2 nd	Basic concepts.	
	3 rd	Existence conditions.	
	4 th	Transform of elementary functions.	
6 th	1 st	Properties of Laplace transform.	Properties of Laplace transform. Multiplication and division property.
	2 nd	Transform of derivatives and integrals.	
	3 rd	Multiplication and division property.	
	4 th	Evaluation of integrals by Laplace transforms.	
7 th	1 st	Inverse transforms.	Inverse transforms. The Convolution theorem. Second shifting prop.
	2 nd	The Convolution theorem	
	3 rd	Unit step function.	
	4 th	Second shifting theorem.	
	1 st	Dirac's Delta function.	Solution of differential equations with
	2 nd	Solution of differential equations with Laplace Transformation.	

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8 th	3 rd	Differential equation with variable Coefficient.	Laplace Transformation.
	4 th	Solution of simultaneous linear differential equations.	
Unit-III [Ordinary Differential Equations and its applications]			
9 th	1 st	Exact differential equations.	First order and first degree to simple electric circuits.
	2 nd	Equations reducible to exact differential equations.	
	3 rd	Applications of differential equations.	
	4 th	First order and first degree to simple electric circuits.	
10 th	1 st	Newton's law of cooling.	Newton's law of cooling. Linear differential equations of second and higher order.
	2 nd	Heat flow.	
	3 rd	Orthogonal Trajectories.	
	4 th	Linear differential equations of second and higher order.	
11 th	1 st	Complete solution.	Complete solution. Particular integral.
	2 nd	Complementary function.	
	3 rd	Particular integral.	
	4 th	Method of variation of parameters.	
12 th	1 st	Method of undetermined coefficients to find the particular integral.	Method of undetermined coefficients to find the particular integral. Cauchy's th.
	2 nd	Cauchy's and Legendre's linear equations.	
	3 rd	Simultaneous linear equations with constant coefficients.	
	4 th	Important points and formulas	
Unit-IV [Vector Calculus]			
13 th	1 st	Differentiation of Vectors.	Directional derivative. Differentiation of Vectors.
	2 nd	Scalar and vector point functions.	
	3 rd	Gradient of a scalar field.	
	4 th	Directional derivative.	
14 th	1 st	Divergence and Curl of a vector field and their physical interpretations	Divergence and Curl of a vector field and their physical interpretations
	2 nd	Line integrals.	
	3 rd	Surface integral.	
	4 th	Volume integral.	
15 th	1 st	Green's theorem in the plane.	Green's theorem in the plane. Stoke's Theorem.
	2 nd	Stoke's Theorem.	
	3 rd	Gauss Divergence Theorem (without proof) and their applications.	
	4 th	Important points and formulas.	

Text Books

1. E. Kreyszig, *Advanced Engineering Mathematics*, Wiley India.
2. Higher Engineering Mathematics B.V. Ramana, Mc-Graw Hill.
3. A text Book of Engineering Mathematics N.P. Bali, Luxmi Publication Pvt. Ltd.

Reference Books

1. G. B. Thomas, R. L. Finney, *Calculus and Analytic Geometry*, Pearson Education.
2. B. V. Ramana, *Engineering Mathematics*, Tata McGraw Hill.
3. Michael D. Greenberg, *Advanced Engineering Mathematics*, Pearson Education, Prentice Hall.

Note: Examiner will set eight questions by selecting two from each unit. Students will be required to Attempt five questions selecting at least one question from each unit.