

LESSON PLAN BCA-II SEMESTER MATHEMATICAL FOUNDATIONS-II KUK

Name of the Faculty : Dr. Sushil Kr. Sinha
Discipline : BCA
Semester : BCA-II
Subject : Mathematical Foundations-II (BCA-123)
Lesson Plan Duration : 15 weeks (from January-2020 to April-2020)

Work Load: (Lecture + Tutorial) per week (in hours): Lecture-03, Tutorial-01

Week	Lecture Day	Theory Topic	Tutorial Topic
Unit-I			
1 st	1 st	Introduction	Introduction of the matrix.
	2 nd	Symbolic Notation Statement	
	3 rd	Propositions and logical operators,	
	4 th	Logical Connective	
2 nd	1 st	Truth tables and propositions generated by a set.	Truth Table and Negation
	2 nd	Negation of the compound statement	
	3 rd	Equivalence and implications,	
	4 th	Conditional statement	
3 rd	1 st	Bi-conditional Statement	Tautologies, Contradiction, Logical equivalence.
	2 nd	Tautologies, Contradiction, Logical equivalence	
	3 rd	Laws of logic,	
	4 th	Mathematical system,	
4 th	1 st	Proposition over a universe	Mathematical Induction, Quantifiers.
	2 nd	Mathematical induction, Quantifiers	
	3 rd	Negation of statement with quantifiers	
	4 th	Revision	
Unit-II			
5 th	1 st	Binary operations on a non empty set,	Binary operation and Groups properties.
	2 nd	Groups,	
	3 rd	Subgroups	
	4 th	Normal Subgroups	
6 th	1 st	Cosets,	Cosets, Factor Group.
	2 nd	Factor groups,	
	3 rd	Rings,	
	4 th	Sub rings	
	1 st	Ideals,	Ideals, Factor ring.
	2 nd	Factor rings,	

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7 th	3 rd	Prime ideals,	
	4 th	Minimal ideal,	
8 th	1 st	Fields,	Field.
	2 nd	Direct product of groups,	
	3 rd	Isomorphism of groups (definitions and examples only)	
	4 th	Rings (definitions and examples only)	
Unit-III			
9 th	1 st	Introduction of Matrices	Basic of the matrices.
	2 nd	Basic operation on the matrix	
	3 rd	Addition of matrices,	
	4 th	Multiplication of matrices,	
10 th	1 st	Determinants	Determinants Minor and co-factor of a matrix.
	2 nd	Minor and co-factor	
	3 rd	Laws of matrix algebra,	
	4 th	Singular and non singular matrices,	
11 th	1 st	Transpose of a Matrix, Ad-joint of a matrix	Transpose of a matrix.
	2 nd	Symmetric and skew-symmetric matrix	
	3 rd	Inverse of a matrix,	
	4 th	Rank of a matrix,	
12 th	1 st	Rank of the product of two matrices,	Rank of the product of two matrix.
	2 nd	Systems of linear equations i.e. $AX=0$	
	3 rd	Systems of linear equations i.e. $AX=B$	
	4 th	Revision	
Unit-IV			
13 th	1 st	Introduction	Characteristics equations of a square matrix..
	2 nd	Characteristic Matrix	
	3 rd	Characteristic equations of a square matrix,	
	4 th	Scalar Polynomial and vector polynomial	
14 th	1 st	Cayley-Hamilton Theorem,	Cayley's Hamilton Theorem.
	2 nd	Eigen values	
	3 rd	Eigen vectors,	
	4 th	Eigen values and eigen vectors of symmetric skew symmetric,	
15 th	1 st	Hermitian	Hermitian & Skew-Hermitian Matrix.
	2 nd	Skew –Hermitian matrices,	
	3 rd	Diagonalization of a square matrix.	
	4 th	Revision	

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Text Books

1. Element of Mathematical Foundations-II, Jeevansons Publications.
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. Babu Ram : Discrete Mathematics.
2. Shanti Naryana : A text book of matrices
3. Alan Doerr And Kenneth Levaseur, Applied Discrete Structures For Computer Science, Galgotia Publications Pvt. Ltd., New Delhi.
4. Seymour Lipschutz And Marc Lars Lipson, Discrete Mathematics”, Mcgrraw- Hill International Editions, Schaum’s Series, New York.

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.