ST. JOSEPH'S EVENING COLLEGE (AUTONOMOUS)

DEPARTMENT OF COMPUTER APPLICATIONS
TEACHING LESSON PLAN FOR MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE
BCA 1st Semester (June, 2018 to September, 2018)

Objective of the subject: To help students understand applications of mathematics in the field of computer networks and algorithm design and analysis.

Name of the Faculty: Mrs. Annie Syrien

Time/Hours required – 60 hrs

Sl. No.	Module and Topics	No. of Hours.	Teaching methods	Evaluation of Learning process
Unit I	**Sets, Relations and Functions**	7 **Hrs**	Lecture	Exercise problems and Assignment problems
	Definition of set, intersection,	1		
	union and compliments.	1		
	Principal of inclusion and exclusion,	1		
	De Morgan's laws,	1		
	cardinality difference, symmetric difference.	1		
	Cartesian product, relations.	2		
Unit II	**Matrix Theory**	12 **Hrs**	Lecture	Exercise problems and Assignment problems
	Review of fundamentals,	3		
	equivalent matrices,	2		
	elementary row (column) operations, and	1		
	rank of a matrix by reducing it to the normal form,	3		
	rank of a matrix by reducing it to echelon form.	3		

Unit III	**Mathematical Logic**	**10 Hrs**		
	Connectives, Negation, Conjunction, Disjunction, conditional, bi-conditional, statement	2		
	formulas,	1		
	Tautology and contradiction,	2	Lecture	Exercise problems and Assignment problems
	Equivalence formulae			
	Normal forms: Principle conjunctive and disjunctive normal forms,	1 2		
	Theory of inferences for Statement calculus validating using truth tables.	2		
Unit IV	**Graph Theory**	**8 Hrs**		
	Definition of a Graph, Finite and Infinite Graphs,	1		
	Incidence and Degree of a vertex, Null Graph, Sub graphs,	1		
	Walks, Paths, Circuits,	2	Lecture	Exercise problems and Assignment problems
	Connected, Disconnected graphs and Components,	1		
	Euler Graph,	1		
	Hamiltonian Path and Hamiltonian Circuits.	2		
Unit V	**Trees And Matrix Representation**	**10 Hrs**		
	Properties of Trees,	1		
	Distance and Centres in a Tree, Rooted and Binary Trees, Spanning Trees and Fundamental Circuits.	2	Lecture	Exercise problems and Assignment problems
	Cutset, properties of a Cutset.	2		
	Matrix Representation of graphs: Incidence matrix,	1		
	Circuit matrix,	1		

	Fundamental Circuit Matrix,			
	Cutset matrix,	1		
	Path matrix,	1		
	Adjacency matrix	1		
Unit VI	**Planar and Dual Graphs**	**7 Hrs**	Lecture	Exercise problems and Assignment problems
	Planar Graphs,	1		
	Kurtowski's two Graphs,	2		
	Different Representations of a Planar Graph,	2		
	Detection of Planarity.	2		
Unit VII	**Directed Graphs**	**8 Hrs**	Lecture	Exercise problems and Assignment problems
	Definition, some types of Digraphs,	2		
	Digraphs and Binary relations,	1		
	Directed paths and Connectedness,	1		
	Euler Digraphs,	1		
	Trees with directed edges,	1		
	Fundamental Circuits in Digraphs,	1		
	Adjacency Matrix of a Digraph.	1		