JABALPUR ENGINEERING COLLEGE, JABALPUR (M.P.)

Scheme of Examination w.e.f. July, 2017 batch

THIRD SEMESTER (M.Sc. Applied Mathematics)

S.NO.	SUBJECT CODE	SUBJECT	Periods Per Week				Maximum Marks (Theory Slots)			Maximum marks (Practical Slots)		Total Marks	Remarks
			L	T	P	TOTAL Credits	End Sem. Exam	Mid Sem Exam	Assignment/ Quiz	End Semester Practical/ Viva	Practical Record/ Assignment/Quiz/ Presentation		
1	AM-3001	Topology	4	1	...	5	70	20	10	...	.....	100	
2	AM-3002	Optimization techniques	4	1	...	5	70	20	10	...	...	100	
3	AM-3003	Functional Analysis	4	1	...	5	70	20	10	...	.....	100	
4	AM-3004	ELECTIVE-I	4	1	...	5	70	20	10	...	.....	100	
5	AM-3005	LAB-III (SCI LAB)	....	...	8	8	...	...	...	90	60	150	
6	AM-3006	Self Study & Group Discussion	...	...	4	4	...	...	...	...	100	100	
		TOTAL	16	4	12	32	280	80	40	90	160	650	

L-Lecture T-Tutorial P-Practical

Elective I: Data Structure & Relational Data Base Management System
Elective-I: Financial Mathematics & Its Applications
Elective-I:Finite Element Methods

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Jabalpur Engineering College, Jabalpur (M.P.)

M. Sc. III Semester(Applied Mathematics)

SUBJECT –Topology

Subject Code : AM3001

UNIT-I

Topological Spaces: Definition, open sets and closed sets, neighborhood, limit points, interior points, Kuratowski theorem, bases and sub-bases for topology, subspaces, community and homomorphism.

UNIT-II

Compcactness : Covers, compact spaces, finite intersection property, product spaces, Tychonoff theorem generalized Hein-Boral theorem, compact metric spaces, Bolzauro-Weierstrass theorem.

UNIT-III

Saparation Axioms: T0 spaces, T1 spaces, T2 spaces (Hausdroff spaces), regular and normal spaces, completely regular spaces, Uryshon's lemma.

UNIT-IV

Connectedness: Connected spaces, components, totally disconnected and totally connected spaces.

UNIT-V

Nets and Filters: Nets, Convergence of nets in a topological space ,cluster point of a net, filter, ultra filter, convergence of filters.

Book References:

1. Introduction to topology and modem analysis by G.F. Simmons.
2. Topology by J.N. Sharma.
3. Introduction of general topology by W.J. Pervin
4. Introduction to topology by M.S. Mansfield.
5. Topology by R.S. Agarwal.

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Jabalpur Engineering College, Jabalpur (M.P.)

M. Sc. III Semester(Applied Mathematics)

SUBJECT –Optimization techniques

Subject Code : AM3002

UNIT-I

Linear Programming Problems: Formulation of LPP Graphical methods, Central problems of LPP, Basic Theorems & Properties, Two Phase Method, Big M-method, Revised simplex Method, Primal & Dual Simplex, Method & Sensitivity Analysis.

UNIT-II

Transportation and Assignment Problems: Matrix form of transportation problems, initial Basic Feasible solution, Transportation Algorithm, Degeneracy in Transportation problems Unbalanced Transportation Problems, Assignment Problems, Assignment Algorithm, Unbalanced Assignment Problem & Routing.

UNIT-III

Integer and non linear programming problems: Formulation techniques, Gomory's All Lpp Method, All Lpp Algorithm, Branch & Bound Techniques, Applications, of LPP Solution of Non linear problems convex and concave function ,Kuhn Tucker condition for Constraints optimization, Quadratic Programming and Application.

UNIT-IV

Dynamic Programming: Decision Tree, Bellman's Principal of optimality, solution of problem Finite number of stages, concepts of Dynamic Programming, Model I: Minimum pain problem; Model II: Single Additive constraint, Multiplicatively separable return; Model III: single multiplicatively Constraint, Additively Separable Return; Model IV: System involving more than one constraint mathematical formulation of multi stage model backward & forward recursive approach and simple application.

UNIT-V

Decision Theory: Decision under uncertainty, Decision under risk, The Bayesian decision rule decision tree utility theory, Theory of Games, games with and without saddle points Minimax & Maximin criteria of optimality for mixed strategies, Rectangular games and their solution by different methods.

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Book References:

1. Operation research by S. D. Sharma.
2. Operation Research an Introduction by H.A. Taha: Macmilian Publication.
3. Operation Research by Kanti Swaroop, R.K. Gupta & Manmohan: Publication Sultan Chand.
4. Principle of operation research by H.M. Wagner Publication Prentice Hall of India.

Jabalpur Engineering College, Jabalpur (M.P.)

M. Sc. III Semester(Applied Mathematics)

SUBJECT –Functional Analysis

Subject Code : AM 3003

UNIT-I

Linear spaces, linear operators, infinite dimensional spaces, extension theorem for linear operations and linear functionals . Hemal bases, transpose of a linear operator, annihilators ranges and null manifolds.

UNIT-II

Normal linear spaces, Banach spaces, quotient spaces, inner product spaces, orthogonal sets. Complete orthogonal sets and Hilbert spaces.

UNIT-III

Topological linear spaces symmetric balance, absorbing and convex sets, Minkoswski functionals . Linear varieties, convex sets and hyper plane, semi norms.

UNIT-IV

Locally convex spaces, weak topologies for linear spaces metric linear spaces, spaces of linear operators integral equation of second kind. The Nuemann expansion l^2 kernals, relation between differential and integral equation, closed linear operations, the mapping principal.

UNIT-V

Normal conjugate of normed linear spaces. Hann Banach theorem second normal conjugate spaces and principal of uniform boundedness.

Books References:

1. Introduction of functional analysis; A.F. Taylor.
2. Introduction to topology and modern analysis; G.F. Simmons

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Jabalpur Engineering College, Jabalpur (M.P.)

M. Sc. III Semester(Applied Mathematics)

SUBJECT –Data Structure and Relational Data Base Management System

Subject Code: AM3004

UNIT-I

Basic Concepts: Object oriented design, data abstraction & encapsulation, algorithm specification, performance analysis and measurement basics of C++ abstract data types & C++ Classes templates in C++ arrays and representation of arrays.

Stack and Queues : stacks, operations on stack, queues, operations on queues, applications of stacks queues, operations on stack.

UNIT-II

Linked list: linked list in C++, circular lists, linked stacks & queues, sparse polynomials sparse matrices and doubly linked list.

Tree: binary trees, binary tree traversal, binary expression tree and binary search trees.

UNIT-III

Sorting : Insertion sort, quick sort, merge sort and heap sort, algorithms and their performances analysis. Database concepts: Database users, characteristics of the database, data models. Architecture and data independence, data base language and interfaces.

UNIT-IV

Relational data model: Tables relations and first normal form, relational model operators and integrity rules.SQL data definition in SQL, view and queries in SQL Specifying constraints and indexes of SQL.

UNIT-V

Normal Forms : First normal form, Functional dependencies, second normal form, third normal form, Boyce Codd normal form, multi-valued dependency, fourth normal form.

Book References:

1. Date C. J. An introduction to data base system.
2. Desai B. An Introduction to data base concept.
3. Elamsan and navathe Fundamentals of data base system
4. Ullman J.D. Principles of data base system
5. Korth H.F. Data base system concepts.

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