

Solapur University

Direct Second Year Admission of MCA

(Under the faculty of Engineering, Commerce and Science)

Implemented from Academic year 2013- 14

Bridge Course

The bridge course is for the direct MCA II year admitted Candidates

Paper No.	Paper Name	University Exam. Marks
I	Discrete Mathematical Structures	100
II	Operating System	100
Total Marks		200

Important notes-

- Syllabus for bridge course is based on Present MCA part - I syllabus for the respective subjects.
- The Examination for bridge course will be conducted by University along with regular semester examination.
- **Bridge Course should be completed before award of MCA degree.**
- Nature of Theory question paper for bridge course is same as that of MCA part-I
- Text books and reference books will be same as prescribed in present MCA syllabus.
- The respective Institution/College shall arrange for completing the syllabus of Bridge Course. However no teaching-learning fees shall be charged from students for completing the syllabus of bridge course.

Paper – I

Discrete Mathematical Structures

Unit – I :

1. Combinatorics: Permutations and combinations, Distinct and non-distinct objects, Generating functions for combinations, Enumerators for permutations, Distribution of distinct objects. [7]
2. Matrices: Basic concepts, Types of matrices, Arithmetic operations on matrices, Scalar Multiplication, Transpose of matrix, Symmetric matrix, Inverse of matrix, Solving simultaneous equation using matrices, Boolean matrices, Eigen values, Eigen vectors, Determinant. [8]

Unit – II :

1. Mathematical Logic: Notations, Connectives, Normal forms, Theory of inference for statement calculus, Propositional logic, Predicate calculus, Inference theory of the predicate calculus. [15]

Unit – III :

1. Relations and Functions : Elementary set theory, product sets, Relations, Closure properties and related algorithm, Functions, Types of functions, Computer representation of sets, Relations, functions and their manipulations, ordering functions, Recursion. [15]

Unit – IV :

1. Graph Theory: Definition, walks, paths, trails, connected graphs, Di-graph representation of relations, regular and bipartite graphs, cycles and circuits, eccentricity of a vertex, radius and diameter of a graph, Central graphs, Hamiltonian and Eulerian graphs, and planar graphs. [8]
2. Algebraic structures: Groups, Lattices, Applications of the Residue Arithmetic's to computers, Group Codes, Definition & examples of algebraic structures their applications to computer science. [7]

Reference Books

- 1) A. Doerr, Discrete Mathematics for Computer Science,(Galgotia-86).
- 2) Kolman & Busby, Discrete Mathematical Structures for Computer Science, (Prentice Hall).
- 3) Joshi K.D., Discrete Mathematics, (Wiely Eastern).
- 4) Liu C.L., Elements of Discrete Mathematics, (TMH-77).
- 5) S. Sahni, Concepts in Discrete Mathematics, (Camclot Publisher,USA).
- 6) Schaums series, Discrete Mathematics (McGraw Hill).
- 7) Tremblay & Manohar, Discrete Mathematical Structures with applications to the Computer Science, (TMH-77).

Paper - II

OPERATING SYSTEM

UNIT-I

15

1. **Introduction and structure of Operating System:** Concept of multi – programming, Parallel, Distributed and real – time – sharing, Operating system structure - Operating system components and Services System Call System.

UNIT-II

15

1. **Process Management, Synchronization and Deadlocks:** Process Concept, process scheduling, cooperating process, Threads, inter process communication, CPU scheduling Criteria, scheduling algorithms-FCFS, SJF, Priority, Round Robin, Multilevel feedback queue scheduling.
2. **Process Synchronization and Deadlocks :** Critical Section problem, Synchronization hardware, Semaphores, Critical region, Monitors, Deadlock system model, characterization of deadlocks and deadlock Prevention, Avoidance and detection, recovery from deadlock.

UNIT-III

15

1. **Memory Management:** Memory Management, Logical and physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation.
2. **Virtual, memory:** demand paging and its performance, page replacement algorithm, allocation of frames, thrashing.

UNIT-IV

15

1. **File System:** Secondary Storage Structure File Concept Access method, Directory Structure, Protection and consistency Semantics, File System Structure, Allocation Method, Free space Management, Directory implementation, Disk Structure, Disk Scheduling methods, Disk Management, Swap space Management.
2. **Security and protection:** goals of protection domain of protection, access matrix, security program threats, system threats.

CASE Study: Network Operating System, OS Environment, Comparison of Distributed Operating System, Multiprocessor Time Sharing Systems and Network Operating System.

Reference Books :

- 1) Operating System Principles – Abraham Silberschatz, Peter Galvin, Gerg Gagne, 7th ed., Wiley Student Edi.
- 2) Operating System – Bawn
- 3) Modern O. S. – Tanenbaum - PHI
- 4) Donovan Madnick, Operating System
- 5) Peterson, operating system.