

MCA Syllabus under Choice Based Credit System for the students admitted in the sessions 2018-2019 and onwards.

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under
Choice Based Credit System
for the students admitted in the sessions 2018-
2019 and onwards.

**DEPARTMENT OF COMPUTER SCIENCE & IT,
UNIVERSITY OF JAMMU**

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MCA COURSE STRUCTURE

Semester-Wise Distribution of Courses and Credits

Semester I

Course No.	Title	Credits	Contact hours per week L-T-P
PSCATC102	Problem Solving & Programming in C	4	4-0-0
PSCATC103	Computer Organization & Assembly Language	4	4-0-0
PSCATC107	Operating System Principles	4	4-0-0
PSCATC108	Discrete Mathematics	4	4-0-0
PSCAPC190	Practicals(<i>based on C and Unix/Linux</i>)	6	0-0-10
Semester-I Total: -		22	16-0-10

Semester II

Course No.	Title	Credits	Contact hours per week L-T-P
PSCATC203	Data Structures using C-Language	4	4-0-0
PSCATC208	Database Management System & Oracle	4	4-0-0
PSCATC209	Computer Architecture & Microprocessor	4	4-0-0
PSCATC212	Computer Networks	4	4-0-0
PSCATC213	Application Programming using Java	4	4-0-0
PSCAPC290	Practicals(<i>based on Data Structures, Oracle and Java</i>)	6	0-0-10
Semester-II Total: -		26	20-0-10

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Semester III

Course No.	Title	Credits	Contact hours per week L-T-P
PSCATC310	Algorithm Design & Analysis	4	4-0-0
PSCATC311	Computer Graphics	4	4-0-0
PSCATC313	Web Technologies	4	4-0-0
	*Open Course-I	4	4-0-0
PSCAPC390	Practicals(<i>based on Computer Graphics and Web Technologies</i>)	6	0-0-10
Semester-III Total: -		22	16-0-10

*Students shall register for this Course from other Departments of University. He/she may opt for MOOC course of equivalent credits instead.

Semester IV

Course No.	Title	Credits	Contact hours per week L-T-P
PSCATC420	Theory of Computation	4	4-0-0
PSCATC422	Numerical & Statistical Computing	4	4-0-0
PSCATC423	Software Engineering	4	4-0-0
	*Open Course-II	4	4-0-0
Elective-I	<i>(any one of the following)</i>		
PSCATE424 PSCATE425	Python R	4	4-0-0
PSCAPC490	Practicals(<i>based on Numerical & Statistical Methods and Python/R</i>)	6	0-0-10
Semester-IV Total: -		26	20-0-10

*Students shall register for this Course from other Departments of University. He/she may opt for MOOC course of equivalent credits instead.

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Semester V

Course No.	Title	Credits	Contact hours per week L-T-P
PSCATC504	Artificial Intelligence	4	4-0-0
PSCATC511	Principles of Compiler Design	4	4-0-0
PSCATC518	.NET Technology & C#	4	4-0-0
Elective-II	<i>(any one of the following)</i>		
PSCATE515 PSCATE516	Image Processing Mobile Technologies	4	4-0-0
PSCAPC590	Practicals(<i>based on .NET and Image Processing/Mobile Technologies</i>)	6	0-0-10
Semester-V Total:-		22	16-0-10

Semester VI

PSCADC601

Project work: 26 credits

The project in sixth semester shall carry 650 marks distributed as follows:

Project Component		Marks
Mid-Semester Presentation & Internal Evaluation		250
End-Semester Evaluation	Project Evaluation	250
	Project Viva-voce	150
Semester-VI Total: -		650

NOTE:The students of Computer Science Department will register for two courses of 4 credits each from other Departments of University.

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Requirements for earning the MCA degree

The total credit required for the MCA programme is 144 credits. The total credits are distributed over three categories:

CATEGORIES	DESCRIPTION	CREDITS	
Post-graduate Semester Core Courses (PSCC)	Core Departmental Courses	128	136
Post-graduate Semester Elective Courses (PSEC)	Elective Departmental Courses	08	
Post-graduate Semester Open Category courses (PSOCC)	Other Department Courses	08	
	TOTAL CREDITS	144	

The PSCC and PSEC are mandatory for earning the degree in the MCA programme. The balance credits may be chosen from the category PSOCC as per the talent of the student and the advice of the academic Board.

Course credits assignment

Lectures and Tutorials: One lecture or tutorial hour per week per semester is assigned one credit.

Practical/Laboratory: One and half laboratory hour per week per semester is assigned one credit.

SCHEME FOR PAPER SETTING (MAJOR EXAMINATION)

The question paper shall be divided into two sections (A & B). No question shall be repeated in the question paper.

Section A

Short Answer Type Questions (100-150 words)

In this section the examiner needs to set Five (5) short answer type questions. One question shall be set from each unit. The candidates are required to answer all questions in this section. Each question shall carry 4 marks.

(5 X 4 = 20 marks)

Section B

Long Answer Type Questions

In this section a total of Eight (8) questions shall be set as per the following guidelines:-

- One question each shall be set from Unit-I and II.
- Two (2) questions each shall be set from Unit-III, IV and V.

The candidates are required to answer any Five (5) questions in this section. Each question shall carry 8 marks.

(5 X 8 = 40 marks)

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EXAMINATION:

There shall be three tests in each semester and the student shall be continuously evaluated during the conduct of each course on the basis of their performance as follows:

THEORY	Syllabus to be covered in the examination	Time allotted for the exam.	% Weightage (Marks)
Minor test I (after one month)	Upto 25%	1 ½ hours	20
Minor test II (after two months)	Upto 50%	1 ½ hours	20
Major test * (after end of semester)	Upto 100%	3 hours	60
*(i) 60% weightage in Major Test shall be given to those units which have not been covered in the two Minor Tests. (ii) Certain questions may be framed in such a way which may require knowledge of more than one unit or one question may have multiple parts either subjective and/or objective from one or more units i.e. certain questions may be from across units.			
Total			100
PRACTICAL			
Daily evaluation of practical records/Viva voce etc.			75
Final Practical performance + viva voce (Internal Examination)	100% syllabus		75
Total			150

ATTENDANCE:

Each course (theory, practical etc.) shall be treated as an independent unit for the purpose of attendance. A student shall be required to attend a minimum of 75% of the total instruction hours in a course including tutorials and seminars in each semester. A student who fails to secure 75% attendance in a course shall not be eligible to appear in the semester examination in that course and shall be required to repeat that course.

CRITERIA FOR PROMOTION OF A STUDENT TO NEXT HIGHER SEMESTER:

A student will be eligible to proceed from 1st semester to 2nd semester, from 2nd semester to 3rd semester, from 3rd semester to 4th semester, from 4th semester to 5th semester and from 5th to 6th semester if he/she has earned 50% credits in Theory/Practical Courses cumulatively in earlier semesters of the programme and has completed the minimum attendance requirements.

ABSOLUTE GRADE SYSTEM

MARKS	Grade	Grade Points	Description of performance
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≥ 90	O	10	Outstanding
≥ 75 and < 90	A+	9	Excellent
≥ 65 and < 75	A	8	Very Good
≥ 55 and < 65	B+	7	Good
≥ 50 and < 55	B	6	Above Average
≥ 40 and < 50	C+	5	Average
≥ 36 and < 40	C	4	Pass/Below Average
> 20 and < 36	D	2	Fail/Poor
≤ 20	E	0	Very Poor

'D' and 'E' grades refer to unsatisfactory performance. The student shall have to repeat all compulsory courses where the D/E grade is obtained. The weightage of 'D' and 'E' Grades shall not be counted in SGPA or CGPA. Other grades would include:

GRADES	DESCRIPTION
I	Incomplete
W	Withdrawal
X	Continued Project
S	Satisfactory Completion
Z	Non Completion

CONVERSION FROM CGPA TO PERCENTAGE

The conversion of SGPA or CGPA to Percent score will be carried out by multiplication of respective SGPA or CGPA by a factor of 8.9.

A CGPA of 6.75 shall be considered equivalent to 60% marks.

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MCA - FIRST SEMESTER

Total Marks = 100
MarksNo. of Credits = 4
20 Marks

Minor Test I = 20
Minor Test II =

Major Test = 60 marks

COURSE NO: PSCATC102
COURSE TITLE: PROBLEM SOLVING & PROGRAMMING IN C

UNIT-I

Problem Solving & C Basics:

Steps for problem solving, Computer as a tool for problem solving. Program Design tools: Algorithm, Pseudocode and Flowchart Designing.

History of C, Characteristics of C, Introduction to GCC, compiling, linking and running a C - program, Using MAKE Utility.

C Program Structure, Data Types, Variables and Constants, Printing Out and Inputting Variables, Constants, Type-Casting, Operators and Expressions, Order of Precedence. 10 HOURS

UNIT-II

Control Statements & Arrays:

Conditional Statements, Program Loops and Iteration, Library functions. Syntax, semantic, linker, logical and runtime errors.

Single and Multi-dimensional Arrays, Strings, Basic String Handling Functions.

10 HOURS

UNIT-III

Functions & Further Data Types:

Functions, Passing Parameters, Recursion, Storage classes. Standard C Preprocessor Directives. Standard Formatted & unformatted I/O Functions;

Defining New Data Types, Structures, Unions, Enumerated Types, Bitwise Operators, Bit Fields.

10 HOURS

UNIT-IV

Pointers & Files:

Pointers: Pointers arithmetic, constant void pointers. Dynamic Memory Allocation, Pointers to Pointers, Pointer to array, Array of pointers, Commandline input, Pointers to a Function.

Files Character and Line Based I/O, Formatted I/O, Block I/O, File Positioning.

10 HOURS

UNIT-V

File Accessibility & Graphics Programming:

File Accessibility and Directories (access, stat, chmod, chown ..., chdir, chroot...), Process Control: (Running Linux Commands from C, fork(), the exec family, wait(), exit())

Graphics Programming: OpenGL Basics, OpenGL Utility Toolkit (GLUT), Defining window, Display mode, OpenGL Functions, Primitives (Points, Lines, Polygons) and Attributes, Simple graphics programs.

10 HOURS

SUGGESTED READINGS:

1. B. Kernighan and D. Ritchie, "The ANSI C Programming Language", PHI., 2000.
2. Behrouz A. Forouzan and Richard F. Gilberg, "Computer Science A Structured Programming Approach Using C", PHI, 3rd Ed., 2007.
3. Jeri R. Hanly and Elliot B. Koffman, "Problem Solving and Programming in C", Pearson, 5th Ed. 2007.
4. Yashwant Kanetkar, "Let us C", BPB Publications, 2002.
5. Edward Angel, "OpenGL- A primer", 3rd Ed. , Addison-Wesley 2007.
6. Kurt Wall, Mark Watson, and Mark Whitis, "Linux Programming Unleashed", SAMS.
7. Mark Mitchell, Jeffrey Oldham, and Alex Samuel, "Advanced Linux Programming", New Riders Publishing, 2001.
8. Edward Angel, "Interactive Computer Graphics", 5th Ed., Addison-Wesley 2009

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MCA - FIRST SEMESTER

Total Marks = 100
MarksNo. of Credits = 4
20 Marks

Minor Test I = 20
Minor Test II =

Major Test = 60 marks

COURSE NO: PSCATC103
COURSE TITLE: COMPUTER ORGANIZATION & ASSEMBLY LANGUAGE

UNIT - I

Binary Systems:

Overview of digital computers, Binary Numbers, Number systems, Number based Conversions, Integer & floating point representation using IEEE FORMAT, Rules of Floating point Arithmetic, parity, Error detection and correction methods using Hamming technique, ASCII code representation, Rules of addition/subtraction for r's, (r - 1)'s complements, BCD, excess - 3 codes.

10 HOURS

UNIT - II

Boolean Algebra & Logic Gates: Basic Theorems and functions, Boolean Expressions, Laws of Boolean Algebra, De - Morgan laws, simplification of Boolean Expressions using SOP, POS, K-map. Logic gates, AND, OR, NOT, NAND, XOR, NOR, XNOR Gates & their design.

10 HOURS

UNIT - III

Combinational Circuits: Introduction, Half & Full adders & subtractors, parallel adders and subtractors. Encoder, decoder, Multiplexer, De - Multiplexer, code converters.

10 HOURS

UNIT - IV

Sequential circuits & Memory organization:

Sequential circuits, Basic memory cell, Flip-flops and their types, triggering of flip flops, Registers and their types, bi-directional register.

Memory Hierarchy, Memory and its types, characteristics of memory, memory address map to CPU, cache memory. I/O devices FD/HD disks, VDU; I/O organization, Modes of I/O transfer like DMA, programmed control, interrupts technique.

10 HOURS

UNIT - V

Microprocessor & Assembly Language:

Microcomputer organization, microprocessor organization, Instruction set, addressing modes, stack, subroutines and interrupts, memory organization and I/O interface.

Need and use of Assembly Language, Types of Assemblers (TASM and MASM), assembly Language programming structure, Instruction Sets (operands and opcodes), description of Registers, writing and executing simple assembly programs.

10HOURS

SUGGESTED READINGS:

1. Gear, C.W.: Computer Organization and Programming McGraw - Hill.
2. Tannenbaum, A.S.: Structured Computer Organization Prentice - Hall of India.
3. Mano, M.M.: Computer System Architecture, Prentice - Hall, of India.
4. Langholz, G., Grancioni, J. and Kandel, A.: Elements of Computer Organization, PHI.
5. Assembler Manual for the chosen machine.
6. Hayes: Computer Architecture and Organization, McGraw - Hill International Edition.
7. Sloan, M.E.: Computer Hardware and Organization, 2nd Edn, Galgotia publ. Pvt. Ltd.
8. Floyd: Digital Fundamentals, 3rd edn, Universal bookstall, and pvt.ltd
9. R. K Gaur: Digital Electronics and microprocessor - dhantpat Rai pub.
10. Peter Abel: Assembly language and Programming

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MCA - FIRST SEMESTER

Total Marks = 100
MarksNo. of Credits = 4
20 Marks

Minor Test I = 20
Minor Test II =

Major Test = 60 marks

COURSE NO: PSCATC107
COURSE TITLE: OPERATING SYSTEM PRINCIPLES

UNIT-I

Introduction to Operating Systems: Evolution of operating systems, operating systems concepts, types of operating systems, different views of the operating system, operating system services, System calls, Types of system calls. Operating system Structure, Layered Approach, Microkernels, Virtual machines.

10 HOURS

UNIT – II

Process Management: Process concept, operation on processes, Inter-process communication, mutual exclusion, Process scheduling, Basic Concepts, Scheduling criteria, Scheduling algorithms, Process Synchronization, Inter process Synchronization, Critical section Problem, Semaphores, Monitors, Message passing. Deadlocks, System Model, Deadlock characterization, Deadlock prevention, Deadlock avoidance.

10 HOURS

UNIT – III

Memory Management: Memory management, swapping, contiguous memory allocation, relocation & protection, Memory management, Paging, Segmentation, Intel Pentium Segmentation, Intel Pentium Paging, Virtual memory, demand paging, performance of demand paging, Page replacement algorithms: FIFO, Optimal, LRU, Counting based page replacement.

10 HOURS

UNIT – IV

File & I/O Management: Files system structure, file system implementation, Directory Implementation. Allocation Methods, contiguous allocation, Linked allocation, Indexed allocation Disk organization, disk space management, disk scheduling, Disk Management, RAID Structure.

10 HOURS

UNIT –V

Introduction to LINUX/UNIX: Various parts of operating system, kernel, important parts of kernel;
Files and Directories: pathname; Directory Tree; current working directory; relative pathname; referring to home directories; device files; File permissions; Pipes; tees; mount, init, Files, Directories, Processes Commands: pwd, mkdir, rmdir, ls, cat, more, mv, cp, rm, diff, wc, pwd, wc, who write, who am i, passwd, ps, kill, date, cal, man, gzip, df, chmod, mkdir, cd. Filters: pr, head, tail, cut, paste, sort, uniq, nl, tr. Regular Expression: grep; egrep; fgrep
Vi-Editor, adding and replacing text, commands in Command mode, deletion, navigation, pattern search, repeating commands, undoing last command.

Shell Programming, Shell Script, Logical Operators, If else Statement, Case structure, Looping.

10 HOURS

SUGGESTED READINGS:

1. Silberschartz, Galvin, Gagne: Operating System Concepts 8th edition, WSE wiley.
2. Andrew. S. Tanenbaum: Modern operating systems, Pearson Prentice Hall.
3. Milenkovic M: Operating system-concepts and design, McGraw hillinternational editions.
4. A S Godbole: Operating systems, tata McGraw hill.
5. Deitel H. M. : An Introduction to operating system, addison- Wesley publications.
6. Madnick& Donovan: Operating systems, mcgraw-hill book co.
7. Sumitabha Das- UNIX Concepts and Application, Tata McGraw Hill
8. Richard L. Petersen, The Complete Reference Linux, Tata McGraw Hill

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Total Marks = 100
MarksNo. of Credits = 4
20 Marks

Minor Test I = 20
Minor Test II =

Major Test = 60 marks

COURSE NO: PSCATC108
COURSE TITLE: DISCRETE MATHEMATICS

UNIT - I

Counting Techniques:

Basics of counting pigeon hole principles, permutation and combination, Recurrence Relations & their solution (Homogeneous & non-homogenous), Divide & Conquer Recurrences, Decision trees.

10 HOURS

UNIT - II

Posets, Hasse Diagram and Lattices:

Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, and complemented lattices.

Introduction to fuzzy systems, fuzzy sets, equality of fuzzy sets, normal fuzzy sets, containment, support of a fuzzy set. Alpha-level sets. Basic operation of Fuzzy sets.

10 HOURS

UNIT - III

Graphs:

Introduction to Graphs; Incidence and degree; Handshaking Lemma; Isomorphism; Subgraphs and Union of graphs; connectedness; Walks, Paths and Circuits; Components; Connectedness Algorithm, shortest path Algorithms, Eulerian graph; Fleury's algorithms, Hamiltonian graph - Necessary conditions and sufficient conditions; Travelling salesman problem; Bipartite graphs; Directed Graphs, Binary relations, connectedness in directed Graph.

10 HOURS

UNIT - IV

Trees:

Properties of trees; Pendant vertices in a tree: Center of a tree; Rooted an binary trees; Spanning Trees – spanning tree algorithms; Fundamental circuits; Spanning trees of a weighted graph, cutsets and cut-Vertices; Fundamental cutsets; connectivity and separativity.

10 HOURS

UNIT - V

Planar graphs & Colouring:

Combinatorial and geometric dual; Kuratowski's graphs; Detection of planarity; Thickness and crossings.

Colorings: Vertex coloring, Chromatic number; Chromatic polynomial, The four colour problem, edge coloring, Coloring algorithms.

10 HOURS

SUGGESTED READINGS:

1. Harry, F.: Graph Theory: Addison - Wesley Publ. Camp.
2. Trembly, J.P. and Manohar, R.P.: Discrete Mathematical Structures with Applications to Computer Science, McGraw - Hill.
3. Deo, N.: Graph Theory with Applications to Engineering and Computer Science, Prentice-Hall Inc..
4. Krishnamurthy, V.: Combinatorics: Theory and Applications, Affiliated East-West Press Pvt. Ltd.
5. Doerr, A. and Lvasseur, K.: Applied Discrete Structures of Computer Science, Galgotia Publications Ptv. Ltd.

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MCA - FIRST SEMESTER

Total Marks = 150
No. of Credits = 8

Daily Evaluation = 75 Marks
Final Practical Evaluation = 75 Marks

COURSE NO: PSCAPC190
PRACTICALS

Practicals will be based on following Papers:

1. Problem Solving & Programming In C (PSCATC102)
2. Computer Organization & Assembly Language (PSCATC103)
3. Operating System Principles (PSCATC107)
4. Discrete Mathematics (PSCATC-108)

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MCA - SECOND SEMESTER

Total Marks = 100
MarksNo. of Credits = 4
20 Marks

Minor Test I = 20
Minor Test II =

Major Test = 60 marks

COURSE NO: PSCATC203
COURSE TITLE: DATA STRUCTURES USING C-LANGUAGE

UNIT - I

Fundamental Notations:
Primitive and composite data types, self-referential structures, Algorithms, Types of data structures, Operations, Time and space complexity of algorithms, Asymptotic notation. 10 HOURS

UNIT - II

Linear Data Structures:
Arrays, Linked lists, Stacks, Queues, operations and their complexities, Implementations, Applications. 10 HOURS

UNIT - III

Non-Linear Data Structures:
Trees, Binary Trees, Traversing binary trees, Threaded binary trees, Binary search trees, heaps, Graphs, Traversing graphs. 10 HOURS

UNIT - IV

Indexing Structures:
ISAM, m-way trees, B - trees, B+ - trees, Hashing techniques for direct access, collision in hashing, collision resolution. 10 HOURS

UNIT - V

Sorting:
Internal and External sorts, Bubble sort, Insertion sort, Selection sort, Shell sort, Quick sort, Radix sort, Merge sort, Types of merging. 10 HOURS

SUGGESTED READINGS:

1. G. A. V.Pai, Data Structures and Algorithms: Concepts, Techniques and Applications, Tata McgrawHill, 2008.
2. Ellis Horowitz, SartajSahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, Universities Press, 2008
3. J. P.Tremblay& P. G. Sorenson, Introduction to Data Structures with Applications, TMH, 2007.
4. Seymour Lipschutz, Theory and Problems of Data Structures, Sehaum's Outline Series in Computers Tata McGraw-Hill, 2006
5. A. M. Tannenbaum & M..J. Augenstein and Y. Langsam, Data Structures with C, PHI, 2006.

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MCA - SECOND SEMESTER

Total Marks = 100
MarksNo. of Credits = 4
20 Marks

Minor Test I = 20
Minor Test II =

Major Test = 60 marks

COURSE NO: PSCATC208
COURSE TITLE: DATABASE MANAGEMENT SYSTEM

UNIT - I

Database Management System Concepts:
File based system, Need of Database Management System, Components of DBMS, Data independence, Three level architectural of Database, Centralized and client server architecture for DBMS, Introduction to hierarchical and network data models, Conventional file organizations, Inverted files.

10 HOURS

UNIT - II

Relational Data Model:
Relational data models, Entity relationship model, Conversion of ER diagrams to Relational Database Design, Joins, Relational algebra and relational calculus concepts, Queries using relational algebra and calculus.

10 HOURS

UNIT - III

Normalisation and Concurrency Control :
Concept of keys, Functional dependencies, Inference rules, Covers, Closure, Equivalence of functional dependencies, Multivalued dependencies, Theory of normalization, Normal forms (1st to 5th).

10 HOURS

UNIT - IV

Transaction processing, Deadlocks, Concurrency control, Locking techniques, Timestamp ordering, Recovery management, Recovery techniques, Distributed Database Concepts.

10 HOURS

UNIT - V

SQL :
SQL query processing, Table creation and management, Inbuilt functions, Data integrity constraints, Views, Joins, Operators, Privileges, roles and security policies.

10 HOURS

SUGGESTED READINGS:

1. BipinC.Desai: An Introduction to Database Systems, West-publishing company.
2. Elmasri, Navathe, Somayajulu, Gupta: Fundamentals of DatabaseSystems, Pearson Education.
3. Date, C.J.: An Introduction to Database Systems Addison Wesley Pearson Education.
4. Narayan S Umanath, Richard W Scamell : Data Modelling and Database Design, Thomson Course Technology India Edition.
5. R.A. Parida, Vinod Sharma: The power of Oracle 9i, Firewall Media Publications.
6. DeshPande: SQL/PL for Oracle 8 & 8i.

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Total Marks = 100
MarksNo. of Credits = 4
20 Marks

Minor Test I = 20
Minor Test II =

Major Test = 60 marks

COURSE NO: PSCATC209
COURSE TITLE: COMPUTER ARCHITECTURE & MICROPROCESSOR

UNIT – I

Digital Electronics:
Semi-conductor, p-type, n-type formation, pn junction & its characteristics, Bipolar and MOSFET transistors as current controlled and voltage controlled Switch, Basic design for AND, OR, NOT, NAND, NOR using RTL, DTL, TTL, MOS Technology, Tristate logic

10 HOURS

UNIT – II

Sequential Circuits & Computer Arithmetic:
Sequential circuits: Sequence generator, counters, A/D & D/A converters.
Computer Arithmetic: Flowchart, Hardware design & algorithm for signed magnitude & 2's complement form for addition, subtraction, multiplication & division methods, floating point arithmetic.

10 HOURS

UNIT – III

Memory & Register Organization:
Memory: 2D/3D Static RAM, Static and Dynamic Memory, Types of ROM, associative memory and interleaved memory, Random access, Sequential access, direct access, virtual memory, cache memory.
Register transfer logic and micro-operation.

10 HOURS

UNIT – IV

Microprocessor & Control Design:
Internal structure of MPU, ALU & Micro-programmed control unit. Instruction format, Bit Slices, I/O interface adapter (Serial and Parallel), Memory read, Memory write, Memory map and I/O map, Interrupts and its types.

10 HOURS

UNIT – V

Parallel Processing and VHDL:
Classification of parallel machines, pipeline processing, Vector processing, multiprocessor system architecture- multiport memory, crossbar switch, timeshared common-bus, dual-bus, Bus arbitration.
VHDL: Introduction, Need and importance of VHDL, characteristics, basic components of VHDL.

10 HOURS

SUGGESTED READINGS:

1. Malvino, A.P., Leach, D.P.: Digital Principles and Applications, Tata McGraw-Hill.
2. Millman and Halkias: Integrated Electronics, McGraw-Hill.
3. Strangio, C.E.: Digital Electronics – Fundamental Concepts and Applications.
4. Khambata, J.: Microprocessor and Microcomputer, John Wiley and Sons.
5. Liu, Y., Gibson, G.A.: Microcomputer Systems: The 8086/8088 Family, PHI 2nd Edn..
6. Alexandridis Nikitas, A.: Microprocessor System Design Concepts, Galgotia Publications.
7. Stone, S.: Introduction to Computer Architecture, Galgotia Publications, 2nd Edn.
8. Mano, M.M.: Computer System Architecture, Prentice-Hall.
9. Volnei A. Pedroni: Circuit design with VHDL.

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MCA - SECOND SEMESTER

Total Marks = 100
MarksNo. of Credits = 4
20 Marks

Minor Test I = 20
Minor Test II =

Major Test = 60 marks COURSE NO:

PSPCATC212
TITLE: COMPUTER NETWORKS

Unit I Fundamentals of Communication

Fundamentals of Communication, Modulation, Data Encoding, OSI reference model, TCP/IP model, network standardization, Inter-networking
Physical layer, Switching Technique, Transmission media, Co-axial, Twisted Pair and Fiber Optic Cables, Transmission Impairments, Electromagnetic Spectrum, Communication, Radio waves, Microwaves, Satellites, GSM, CDMA.

10 HOURS

Unit II Data Transmission and Media access Concepts

Data Link layer, Design issues, Frame, Error detection and correction, Flow Control, Elementary Data link protocols, Character-oriented and Bit-oriented Protocols, Sliding window protocols.
Channel allocation methods, TDM, FDM, ALOHA, Carrier sense Multiple access protocols, Collision free protocols, IEEE standard 802 for LANS, Ethernet, Token Bus, Token ring.

10 HOURS

Unit III Network Establishment Concepts

Network Layer, Store and Forward Packet Switching, Connectionless and Connection-oriented services, Virtual Circuit, Routing Algorithms, Shortest path, Flooding, Link State, Distant vector, Hierarchical, Broadcast and Multicast Routing. OSPF, BGP, Congestion, Congestion control algorithms.

10 HOURS

Unit IV Internet Protocols

TCP/TP Protocol, IP Addresses, Classes of IP Addresses, Subnets, IPv6, Network layer in the Internet, Internet Control Protocols, ARP, RARP, BOOTP, DHCP, Transport Layer, Protocol Stack, TCP and UDP, Transport Services Primitives, Sockets, Socket Programming concept.

10 HOURS

Unit V Network Application

Application layer, Name service (DNS) Domain Hierarchy, Name servers, Name resolutions, Traditional applications, Telnet, FTP, SMTP, MIME, World wide web-HTTP, HTTP Methods.
Network security-Cryptographic Algorithms, DES, AES, RSA, Key exchange methods.

10 HOURS

MCA Syllabus under Choice Based Credit System for the students admitted in the sessions 2018-2019 and onwards.

SUGGESTED READINGS:

1. Andrew S.Tanenbaum, "Computer Networks", 5 e, 2003, Pearson Education Asia.
2. Behrouz A. Forouzan, "Data Communications and Networking", 4e, 2004,Tata McGraw Hills.
3. William Stallings. "Data and Computer Communication", 7e, 2003, Pearson Education Asia.
4. Prakash C. Gupta, Data Communications and Computer Networks, PHI
5. Michael A. Miller, "Data and Network Communications", 2e, Delmar Thomson Learning.
6. James F. Kurose and Keith W. Ross, "Compter Networking", 3e, Pearson Education.
7. William A. Shay, Understanding Data Communications and Networks, 2e, Thomson Asia Pvt. Ltd.
8. Peter Norton and Dave Kearns, "Complete Guide to Networking", ie,Techmedia India Ltd.
9. Douglas E. Comer, Internenetworking with TCP/IP Vol I & II, 3e, PHI

MCA Syllabus under Choice Based Credit System for the students admitted in the sessions 2018-2019 and onwards.

MCA - SECOND SEMESTER

Total Marks = 100
Marks/No. of Credits = 4
20 Marks

Minor Test I = 20
Minor Test II =

Major Test = 60 marks

COURSE NO: PSCATC213
TITLE: APPLICATION PROGRAMMING USING JAVA

UNIT –I **Java Language Basics**

Features, Object Oriented concepts, Java Virtual Machine Concepts, Primitive Data Type And Variables, Java Keywords, Java Operators, Expressions, Control Statements and Arrays.
Class and Objects, Static methods, Constructors, Method Overloading

10 HOURS

UNIT –II **Inheritance, Packages and Interfaces**

Inheritance, Access Control, Method Overriding, Garbage Collection, Abstract Classes, Polymorphism
Packages, Interfaces, Exceptions Handling, Types of Exceptions, Writing Exception Subclasses, Multithreading, Synchronization in Java

10 HOURS

UNIT –III **I/O, Files & Applets Programming**

I/O in Java, Byte Stream Classes, Character Stream Classes, Reading and Writing to Console, Reading and Writing Files, The Transient and Volatile Modifiers, The String and String Buffer Class.
The Applet Class, An Applet Skeleton, Adding images & sound, Passing parameters to an applet.

10 HOURS

UNIT –IV **AWT & Networking**

AWT Components, Building User Interface with AWT, Handling Events, Event Delegation Model (Events, Listeners, interfaces, Anonymous Classes). Layouts and Layout Manager, Introduction to Swing Components

Networking: InetAddress class, URL class, TCP sockets, UDP sockets.

10 HOURS

UNIT – V **Database Connectivity**

JDBC Overview, JDBC implementation, Connection class, Statements, Types of statement objects (Statement, PreparedStatement and CallableStatement), Types of resultset, ResultSetMetadata, Catching Database Results, Handling database Queries, JDBC and AWT.

10 HOURS

SUGGESTED READINGS:

- 1) Herbert Schildt – "Java2 The Complete Reference" , Tata Mcgraw Hill.
- 2) K. Arnold and J. Gosling, "The JAVA programming language", Third edition, Pearson Education, 2000.
- 3) E. Balagurusamy - " Programming with JAVA", Tata McGraw Hill.
- 4) Dietel&Dietel – "Java How to Program" , Pearson Education.
- 5) Steven Holzner – "Java2 Black Book" ,Dreamtech Press.
- 6) George Reese - Database Programming with JDBC and Java, 2nd Edition, O'Reilly.
- 7) Bruce Eckel – "Thinking in Java", Prentice Hall.

MCA Syllabus under Choice Based Credit System for the students admitted in the sessions 2018-2019 and onwards.

MCA - SECOND SEMESTER

Total Marks = 150
No. of Credits = 8

Daily Evaluation = 75 Marks
Final Practical Evaluation = 75 Marks

COURSE NO: PSCAPC290
PRACTICALS

Practicals will be based on following Papers:

1. Data Structures Using C-Language (PSCATC203)
2. Database Management System & Oracle (PSCATC208)
3. Computer Architecture & Microprocessor (PSCATC209)
4. Computer Networks(PSCATC212)
5. Application Programming using Java(PSCATC213)