ACADEMIC REGULATIONS
&
COURSE STRUCTURE

Master of Computer Applications
(MCA)

(Applicable for the batches admitted from 2014-15)

SWARNANDHRA COLLEGE OF ENGINEERING & TECHNOLOGY

Seetharampuram, Narsapur – 534 280, W.G.Dt. Andhra Pradesh

ACADEMIC REGULATIONSFOR MCA (Regular) DEGREE COURSE

(Effective for the students admitted into first year from the academic year 2014-2015)

The MCA Degree of the Swarnandhra College of Engineering & Technology shall be conferred on candidates who are admitted to the program and fulfill all the requirements for the award of the Degree.

Swarnandhra College of Engineering & Technology, an autonomous institution, follows Semester pattern for all three years of its Postgraduate MCA programme with internal and external evaluation

Semester Pattern: Each academic year shall be divided into two semesters; each semester consists of a of 22 weeks duration with a minimum of 110 working days which includes instruction, mid examinations and final examinations with 42 to 48 contact periods per week.

1.0 ELIGIBILITY FOR ADMISSIONS

Admission to the above programme shall be made subject to the eligibility, qualification and specialization prescribed by the University from time to time.

Admissions shall be made on the basis of merit rank obtained by the qualifying candidate at ICET examination or at an Entrance Test conducted by the University subject to reservations prescribed by the University from time to time.

2.0 AWARD OF MCA DEGREE

2.1 A student shall be declared eligible for the award of MCA degree, if he pursues a course of study and completes it successfully for not less than three academic years and not more than six academic years.

2.2 A Student, who fails to fulfill all the academic requirements for the award of the degree within six academic years from the year of their admission, shall forfeit his seat in MCA course.

3.0 ATTENDANCE

3.1 A candidate shall be deemed to have eligibility to write End Semester examinations if he has put in a minimum of 75% of attendance in aggregate of all the subjects.

3.2 Condonation of shortage of attendance up to 10% i.e. 65% and above, and below 75% may be given by the College academic committee.

3.3 Condonation of shortage of attendance shall be granted only on genuine and valid reasons on representations by the candidate with supporting evidence.

3.4 Shortage of attendance below 65 % shall in **NO** case be condoned.

3.5 A candidate shall not be promoted to the next semester unless he fulfills the attendance requirements of the previous semester.

3.6 A stipulated fee shall be payable towards condonation of shortage of attendance

4.1 **DISTRIBUTION AND WEIGHTAGE OF MARKS:**

4.1 The performance of the candidate in each semester shall be evaluated subject-wise, with a maximum of 100 marks for theory and 100 marks for Laboratory, on the basis of Internal Evaluation and End Semester Examination.

4.1.1 **External Evaluation**:

For the theory subjects 60 marks shall be awarded based on the performance in the End Examination Marks. External examination shall be conducted for a duration of 180 minutes with 5 questions to be answered out of 8 questions.

4.1.2 **Internal Evaluations**

40 marks shall be awarded based on the Internal Evaluation. Internal Evaluation shall be made based on the Weighted Average of the marks secured in the two Mid Term- Examinations conducted, one in the middle of the Semester and the other immediately after the completion of instruction. The weights are 80% for the mid in which the student secured highest marks and 20% for the mid in which the student secured lowest marks.

Each mid term examination shall be conducted for duration of 120 minutes with 4 questions to be answered out of 4 questions

4.2 For practical subjects, 40 marks for Internal Evaluation and 60 for external examination. Out of 40 Internal marks 20 marks shall be awarded for day-to-day work including Record work and the remaining 20 marks to be awarded by conducting internal laboratory test. The External Laboratory examination for MCA

course must be conducted with two examiners. One of them is the Laboratory Class Teacher, and the second examiner will be external examiner from outside college

4.3 There shall be a Term Paper presentation during VI semester. For Term paper, a student under the supervision of a faculty member, shall collect the literature on a topic and critically review the literature and submit it to the Department in a report form and shall make an oral presentation before the Department Committee. The Department Committee consists of Head of the Department, supervisor and two other senior faculty members of the department. For Term Paper there will be only internal evaluation of 50 marks. A minimum of 50% of maximum marks shall be obtained to earn the corresponding credits

4.4 A candidate shall be deemed to have secured the minimum academic requirement in a subject if he secures a minimum of 40% of marks in the End Examination and a minimum aggregate of 50% of the total marks in the End Semester Examination and Internal Evaluation taken together. If a candidate secures a minimum of 40% of marks in the End Examination and 40% -49% of the total marks in the End Semester Examination and Internal Evaluation taken together and secures an overall aggregate of 50% in the total semester he may be passed in those subjects also.

4.5 In case the candidate does not secure the minimum academic requirement in any subject (as specified in 4.4) he has to reappear for the End Examination in that subject. A candidate shall be given one chance to re-register for each subject provided the internal marks secured by a candidate are less than 50% and he has failed in the end examination. In such case candidate must re-register for subjects(s) and secure required minimum attendance. Attendance in the re-registered subjects(s) shall be calculated separately to decide upon the eligibility for writing the end examination in those subjects (s). In the event of taking another chance, the internal marks and end examination marks obtained in the previous attempt are nullified. At a given time a candidate is permitted to re-register for maximum of two subjects in addition to the subjects of regular semester.

4.6 A candidate shall be allowed to submit the project report only after fulfilling the attendance requirements of all the semesters. The viva-voce examination shall be conducted at the end of the course work (6^{th} semester).

4.7 **Seminar:** The seminar paper has two components one from the course work without repetition, from the topics studied and the other component is suggested by

the advisor. A hard copy of the information on seminar paper topic in the form of a report is to be submitted for evaluation along with presentation. The two components of the seminar are distributed between two halves of the semester paper and are internally evaluated for 50 marks each. The average of the two components shall be taken as the final score. A minimum of 50% of maximum marks shall be obtained to earn the corresponding credits

4.8 **Mini Project:** The Mini project shall be carried out during the summer break for a minimum of 4 weeks after the IV Semester and to be completed before the start of the V Semester. A report has to be submitted at the beginning of V Semester for assessment by an internal evaluation committee comprising Head of the Department and two faculty of the department including the project Supervisor for 50 Marks. A minimum of 50% maximum marks shall be obtained to earn the corresponding credits

5.0 EVALUATION OF PROJECT WORK

Every candidate shall be required to submit thesis or dissertation after taking up a topic approved by the Project Review Committee.

5.1 A Project Review Committee (PRC) shall be constituted with Principal / Director as chairperson, Head of the Department and two other senior faculty members of the concerned department.

5.2 Registration of Project Work: A candidate is permitted to register for the project work after satisfying the attendance requirement of all the subjects (theory and practical subjects) up to V semester.

5.3 After satisfying 5.2, a candidate has to submit, in consultation with his project supervisor, the title, objective and plan of action of his project work to the Project Review Committee for its approval before the fifth semester end examinations. After obtaining the approval of the Committee the student can initiate the Project work after the fifth semester end examinations.

5.4 Every candidate shall work on projects approved by the PRC of the College.

5.5 The duration of the project is for one semester.

5.6 If a candidate wishes to change his supervisor or topic of the project he can do so with approval of the PRC. However, the Project Review Committee (PRC) shall examine whether the change of topic/supervisor leads to a major change of his

initial plans of project proposal. If so, his date of registration for the project work starts from the date of change of Supervisor or topic as the case may be.

5.7 A candidate shall submit status report in two stages at least with a gap of one month between them.

5.8 The work on the project shall be initiated in the beginning of the Sixth semester and the duration of the project is for one semester. A candidate shall be allowed to submit the project report only with the approval of PRC and not earlier than 20 weeks from the date of registration of the project work. For the approval of PRC the candidate shall submit the draft copy of thesis to the Principal (through Head of the Department) and shall make an oral presentation before the PRC.

5.9 Three copies of the Project Thesis certified by the supervisor & HOD shall be submitted to the College / Department.

5.10 The Project thesis shall be adjudicated by one examiner selected by the Principal from a panel of three examiners, who are eminent in the field and nominated by the concerned Head of the Department.

5.11 The viva-voce examination shall be conducted by a board consisting of the supervisor, Head of the Department and the examiner who adjudicated the Thesis. The Board shall jointly report candidates work as:

A. Excellent

B. Good

C. Satisfactory

D. Unsatisfactory

If the report of the viva-voce is unsatisfactory, the candidate will retake the viva-voce examination after three months. If he fails to get a satisfactory report at the second viva-voce examination, he will not be eligible for the award of the degree unless the candidate is asked to revise and resubmit. If the report of the examiners is unfavorable again, the project shall be summarily rejected.

Head of the Department shall coordinate and make arrangements for the conduct of viva-voce examination.

SEMESTER WISE DISTRIBUTION OF CREDITS

Semester	Theory	Lab	Total Credits
1st Semester	5	3	21
2nd Semester	5	2	19
3rd Semester	5	2 + Seminar	21
4th Semester	5	2 + Mini Project	21
5th Semester	5	2 + Soft Skills /Aptitude Lab	21
6th Semester	Project + Term Paper		17

6. GRADING SYSTEM:

6.1 Award of Grade:

(i) Grade Point Average (GPA):

a) The Grade Point Average (GPA) will be calculated according to the formula.

$$GPA = \frac{\sum C_i G_i}{\sum C_i}$$

Where C_i = number of credits for the subject i

G_i = grade points obtained by the student in the subject.

b) To arrive at Cumulative Grade Point Average (CGPA), the formula is used considering the student's performance in all the courses taken in all the semesters completed up to the particular point of time.

$$CGPA = \frac{\sum C_i G_i}{\sum C_i}$$

Where C_i = number of credits for the subject i

G_i = grade points obtained by the student in the subject.

(ii) After a student satisfies the requirements prescribed for the award of UG/PG Program he/she shall be placed in one of the following four grades. The award of the degree is based on CGPA on a grade point scale of 10.

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CGPA	Award of Division
≥8.00*	First Class with Distinction
≥7.00	First Division
≥6.00	Second Division
≥5.00	Pass Division
<5.00	Unsatisfactory

* In addition to the required CGPA of 8.00, the student must have necessarily passed all the courses of every semester in the minimum stipulated period for the programme.

6.2 Award of Grade in Each Semester:

(i) Based on the student performance during a given semester, a final letter grade will be awarded at the end of the semester for each subject. The letter grades and the corresponding grade points are as given in the Table.

Percentage of Marks Scored	Letter Grade	Grade points
>=90	S	10
80– 89	A	9
70-79	B	8
60-69	C	7
50-59	D	6
< 50	E	Fail

(ii) a student earns a minimum of 6 grade points (D grade) in a subject is declared to have successfully completed the subject, and is deemed to have earned the credits assigned to that subject. However it should be noted that a pass in any subject/term paper/seminar/project/mini project shall be governed by the rules mentioned in against them.

(iii) Grade Sheet: A grade sheet (memorandum) will be issued to each student indicating his performance in all courses taken in that semester and also indicating the grades and SGPA.

(iv) Transcripts: After successful completion of the total programme of study, a Transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued up to any point of study to any student on request and by paying the stipulated fee in force.

(v) Candidates shall be permitted to apply for recounting/revaluation within the stipulated period with payment of prescribed fee.

(vi) The Academic Council has to approve and recommend to the JNTUK, Kakinada for the award of a degree to any student.

7.0 WITH HOLDING OF RESULTS:

If the candidate has not paid any dues to the College or if any case of indiscipline is pending against him, the result of the candidate will be withheld. The issue of degree is liable to be withheld in such cases.

8.0 TRANSISTORY REGULATIONS

Candidates who have discontinued or have been detained for want of attendance or who have failed after having undergone the course are eligible for admission to the same or equivalent subjects as and when subjects are offered, subject to 4.5.

9.0 GENERAL:

9.1 The academic regulations should be read as a whole for purpose of any interpretation.

9.2 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Principal is final.

9.3 The College may change or amend the academic regulations and syllabus at any time and the changes and amendments made shall be applicable to all the students with effect from the date notified by the College.

9.4 Wherever the word he, him or his occur, it will also include she her and hers.

MCA Course Structure R14

(Applicable for the Batches admitted from 2014-15)

First Semester

S.NO	Subject Code	SUBJECT TITLE	L	P	C	I	E	TM
1	PGMC1T01	Fundamentals of Computer and C Programming	4		3	40	60	100
2	PGMC1T02	Digital Logic and Computer System Organization	4		3	40	60	100
3	PGMA1T01	Discrete Mathematical Structures and Graph Theory	4		3	40	60	100
4	PGMA1T02	Probability and Statistical Applications	4		3	40	60	100
5	PGMB1T06	Accounting and Financial Management	4		3	40	60	100
6	PGBS1L01	Communication Skills Lab		4	2	40	60	100
7	PGMC1L01	C Programming Lab		4	2	40	60	100
8	PGMC1L02	Digital Logic and Computer System Organization Lab		4	2	40	60	100
		Total			21	320	480	800

Second Semester

S.NO	Subject Code	SUBJECT TITLE	L	P	C	I	E	TM
1	PGMC2T01	OOPS through JAVA	4		3	40	60	100
2	PGMC2T02	Operating Systems	4		3	40	60	100
3	PGMC2T03	Data Structures using C	4		3	40	60	100
4	PGMB2T08	Perspectives of Organization and Management	4		3	40	60	100
5	PGMA2T01	Operations Research	4		3	40	60	100
6	PGMC2L01	OOPS through Java Lab		4	2	40	60	100
7	PGMC2L02	Data Structures using C Lab		4	2	40	60	100
		Total			19	280	420	700

Third Semester

S.NO	Subject Code	SUBJECT TITLE	L	P	C	I	E	TM
1	PGMC3T01	Database Management Systems	4		3	40	60	100
2	PGMC3T02	Computer Communications	4		3	40	60	100
3	PGMC3T03	Design Analysis and Algorithms	4		3	40	60	100
4	PGMC3T04	Unix Programming	4		3	40	60	100
5	PGMC3T05	Software Engineering	4		3	40	60	100
6	PGMC3L01	Database Management Systems Lab		4	2	40	60	100
7	PGMC3L02	Unix Programming Lab		4	2	40	60	100
8	PGMC3S01	Seminar		-	2	50	-	50
Total					21	330	420	750

Fourth Semester

S.NO	Subject Code	SUBJECT TITLE	L	P	C	I	E	TM
1	PGMC4T01	Data Warehousing and Data Mining	4		3	40	60	100
2	PGMC4T02	Advanced Java and Web Technologies	4		3	40	60	100
3	PGMC4T03	Software Testing Methodologies	4		3	40	60	100
4		**Elective – I**	4		3	40	60	100
5		**Elective – II**	4		3	40	60	100
6	PGMC4L01	Data Warehousing and Mining Lab		4	2	40	60	100
7	PGMC4L02	Advanced Java and Web Technologies Lab		4	2	40	60	100
8	PGMC4M01	Mini Project		4	2	50	-	50
Total					21	330	420	750

Elective-I			Elective-II		
S. No	**Subject Code**	**SUBJECT TITLE**	**S. No**	**Subject Code**	**SUBJECT TITLE**
1	PGMC4TE1	Human Computer Interaction	1	PGMC4TE4	Computer Graphics
2	PGMC4TE2	ERP and Supply Chain Management	2	PGMC4TE5	Artificial Intelligence
3	PGMC4TE3	Mobile Computing	3	PGMC4TE6	Cloud Computing

Fifth Semester

S.NO	Subject Code	SUBJECT TITLE	L	P	C	I	E	TM
1	PGMC5T01	Information Security	4		3	40	60	100
2	PGMC5T02	Object Oriented Analysis and Design Using UML	4		3	40	60	100
3	PGMC5T03	Multimedia Application Development	4		3	40	60	100
4		**Elective – III**	4		3	40	60	100
5		**Elective – IV**	4		3	40	60	100
6	PGMC5L01	Object Oriented Analysis and Design Using UML Lab		4	2	40	60	100
7	PGMC5L02	Mobile Application Development Lab		4	2	40	60	100
8	PGBS5L01	Soft skills Aptitude Lab		-	2	50	-	50
		Total			26	330	420	750

Elective-III				Elective-IV	
S. No	**Subject Code**	**SUBJECT TITLE**	**S. No**	**Subject Code**	**SUBJECT TITLE**
1	PGMC5TE1	E-Commerce	1	PGMC5TE4	Middle Ware Technologies
2	PGMC5TE2	Animation and Gamming	2	PGMC5TE5	Software Project Management
3	PGMC5TE3	Computer Forensics	3	PGMC5TE6	Big Data Analytics

Sixth Semester

S.NO	Subject Code	SUBJECT TITLE	L	P	C	I	TM
1	PGMC6Q01	Term Paper	-	-	2	50	50
2	PGMC6P01	Dissertation/Thesis	-	-	-	--	Excellent/Good /Satisfactory/ Unsatisfactory

L-LECTURE HOURS, P-PRACTICAL HOURS, C-CREDITS, I-INTERNAL MARKS, E-EXTERNAL MARKS, TM-TOTAL MARKS

SWARNANDHRA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

Department of Master of Computer Applications

COURSE STRUCTURE

S NO	SEMESTER	C	I	E	TM
1	I- SEMESTER	21	320	480	800
2	II- SEMESTER	19	280	420	700
3	III- SEMESTER	21	330	420	750
4	IV-SEMESTER	21	330	420	750
5	V- SEMESTER	21	330	420	750
6	VI- SEMESTER	17	50	---	50
TOTAL		120	1640	2160	3800

C-CREDITS, I-INTERNAL MARKS, E-EXTERNAL MARKS, TM-TOTAL MARKS

Fundamentals of Computers and C – Programming

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/I**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC1T01**	

UNIT –I

Introduction to Computers, History and Generations of Computers, Primary and Secondary memory, Input-output devices, ALU, Processor, Applications of computers, Introduction to DOS and Windows, Data representation. Types of languages, ASCII character set. Introduction to LAN, MAN, WAN, Internet and WWW

UNIT –II

Algorithm, pseudo code, flowchart, program development steps, Introduction to various IDE's and their use in C program development, structure of C program, A Simple C program, identifiers, basic data types and sizes, Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bit-wise operators, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation. Control structures such as if, goto, labels, and switch statements.

UNIT –III

Loops- while, do-while and for statements, break, continue, Arrays - concepts, declaration, definition, accessing elements, storing elements, Strings and string manipulations, 1- D arrays other than strings, 2-D character arrays – 2-D arrays other than character arrays – Multidimensional arrays.

UNIT –IV

Functions: basics, parameter passing, storage classes- extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, header files, C preprocessor. Passing 1-D arrays, 2-D arrays, and functions.

Pointers: concepts, initialization of pointer variables, pointers and function arguments, passing by address –dangling memory, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory management functions, command line arguments.

UNIT –V

Derived types: structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit-fields, Input and output – concept of a file, text files and binary files, Formatted I/o, file I/o operations.

TEXT BOOKS

1. Introduction to computers by Peter Nortons, MGH 5th Edition.
2. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
3. Programming with C, Ashok M Kamthene

REFERENCES:

1. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/ Pearson.
2. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press.
3. Programming in C, Stephen G. Kochan, III Edition, Pearson.
4. Let us C by YaswanthKanetkar.

Digital Logic &Computer System Organization

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/I**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC1T02**	

UNIT I:

Digital Components and Data Representation: Introduction, Numbering Systems, Decimal to Binary Conversion, Binary Coded Decimal Numbers, Weighted Codes, Self-Complementing Codes, Cyclic Codes, Error Detecting Codes, Error Correcting Codes, Hamming Code for Error Correction, Alphanumeric Codes, ASCII Code

Boolean Algebra and Logic Gates: Introduction, Postulates of Boolean Algebra, Basic Theorems of Boolean Algebra, Duality Principle, Theorems, Precedence of operators, Venn Diagram ,Boolean Functions and Truth Tables, Canonical Forms for Boolean Functions, Binary Operators and Logic Gates, Simplifying Boolean Expressions, Veitch-Karnaugh Map Method, Four Variable KarnaughMap, Incompletely Specified Function, Quine-McCluskey Procedure

UNIT II:

Digital logic circuits: Combinatorial Switching Circuits: Introduction, Combinatorial Circuit Design Procedure, Integrated NAND-NOR Gates, CMOS Transistor Gates, NAND-NOR Gates with CMOS Transistors, Open Drain and Tri-state Gates, Wired AND Gate, Driving a Bus from Many Sources, Tri-state Gates, Realization of Boolean Expressions Using NAND/NOR Gates, Combinatorial Circuits Commonly Used in Digital Systems, Design of Combinatorial Circuits with Multiplexers, Programmable Logic Devices, Realization with FPLAs, Realization with PALs

Sequential Switching Circuits: Types, Flip-Flops, Counters, Modeling Sequential Circuits– FSM. Synthesis of synchronous, Binary counters.

UNIT III:

Arithmetic and Logic Unit: Introduction, Binary Addition, Binary Subtraction, Complement, Representation of Numbers, Addition/Subtraction of Numbers in1'sComplement Notation, addition/Subtraction of Numbers in Two's Complement Notation, Binary Multiplication, Multiplication of signed Numbers, Binary division, Integer Representation, Floating Point Representation of Numbers, Binary Floating Point Numbers, IEEE Standard Floating Point Representation, Floating Point addition/Subtraction, Floating Point Multiplication, Floating Point Division, Floating Point Arithmetic Operations, Logic Circuits for Addition/Subtraction, Half- and Full-Adder Using Gates, A Four-bit Adder, MSI arithmetic Logic Unit, A Combinatorial Circuit for Multiplication

UNIT IV:

Central Processing Unit: Learning Goals, Introduction, Operation Code Encoding and Decoding, Instruction Set and Instruction Formats, Instruction set, Instruction Format, Addressing Modes, Register Sets, Clocks and Timing, CPU Buses, Dataflow ,Data Paths and Microprogramming, Control Flow.

Micro programmed Control: Control Memory, Address Sequencing, Conditional Branching, Mapping of Instruction, Subroutines, Micro program Example, Computer Configuration, Microinstruction Format, Symbolic Microinstructions, The Fetch Routine, Symbolic Micro program, Binary Micro program, Design of Control Unit, Micro program Sequencer

UNIT V:

Memory Organization: Introduction, Memory hierarchy, Dynamic Random Access Memory, Error Detection and Correction in Memories, Read Only Memory, Dual-Ported RAM, Enhancing Speed and Capacity of Memories, Program Behavior and Locality Principle, Cache in Memory Organization, Design and Performance of Cache Memory System, Virtual Memory, address Translation, Page Replacement, Page Fetching, Page size, address Translation, Page Tables.

Input-Output Organization: Introduction, device Interfacing, Overview of I/O Methods, Program Controlled Data Transfer, Interrupt Structures, Single level Interrupt Processing, Handling Multiple Interrupts, Interrupt Controlled data Transfer, Software Polling, Bus Arbitration, Daisy Chaining, Vectored Interrupts, Multiple Interrupt Lines, VLSI Chip Interrupt Controller, Programmable Peripheral Interface Unit, DMA Based Data Transfer, Input/output (I/O)Processors, Bus Structure, Structure of a Bus Types of Bus, Bus Transaction Type, Timings of Bus Transactions, Bus Arbitration, some Standard Buses, Serial Data Communication, Asynchronous Serial data communication

TEXTBOOKS:

1. Digital Logic and Computer Organization, Rajaraman, Radhakrishnan, PHI, 2006
2. Digital Logic Design, Moriss Mano, PHI
3. Computer System Architecture,3rd ed.,M.MorrisMano,PHI,1994

REFERENCEBOOKS:

1. Computer Organization, 5th ed.,Hamacher, Vranesicand Zaky,TMH,2002
2. Computer System Organization &Architecture, John D. Carpinelli, Pearson, 2008
3. Computer System Organization, NareshJotwani, TMH, 2009
4. Computer Organization &Architecture: Designing for Performance, 7th ed., William Stallings, PHI, 2006

Discrete Structures and Graph Theory

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/I**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMA1T01**	

UNIT –I

Mathematical Logic: Statements and notations, Connectives, Well-formed formulas, Truth Tables, tautology, equivalence, implication, Normal forms, Theory of inference for the statement calculus, Rules of inference, Consistency of premises and indirect method of proof, Automatic Theorem Proving

Predicate calculus: Predicates, statement functions, variables and quantifiers, predicate formulas, free & bound variables, universe of discourse, inference theory of predicate calculus

UNIT –II

Set theory & Relations: Introduction, Relations and ordering, Properties of binary Relations, Equivalence, Compatibility Relations, Partial ordering, Hasse diagram.

Functions: composition of functions, Inverse Function, Recursive Functions, Lattice and its Properties, Pigeonhole Principles and its application.

UNIT –III

Recurrence Relations: Generating Function of Sequences, Calculating Coefficient of generating functions, Recurrence relations, Solving recurrence relation by substitution and Generating functions, the method of Characteristic roots, Solution of Inhomogeneous Recurrence Relation.

UNIT –IV

Graph Theory: Basic Concepts, Representation of Graph, Subgraphs, Multigraphs, Euler Paths, Euler circuits and Graph Isomorphism and its related Problems.

UNIT –V

Graph Theory and Applications: Hamiltonian graphs, Chromatic Numbers, Spanning Trees, minimal Spanning Trees, BFS, DFS, Kruskals Algorithm, Prim's Algorithm's Binary trees, Planar Graphs

TEXT BOOKS

1. Discrete Mathematical Structures with Applications to computer science J.P Tremblery, R.Manohar, TMH

2. Discrete Mathematical for computer Scientists & Mathematicians "J.L.Molt, A.Kandel, T.P.Baker, PHI

REFERENCES:

1. Discrete Mathematical Structures, Kolman, Busby, Ross, 6thed., PHI,2009

2. Discrete Mathematics with Combinatorics and Graph Theory, Santha, Cengage Learning, 2009

3. Discrete Mathematics and its Applications, Rosen, 5thed, T MGraw-Hilled, 2006.

Probability and Statistical Applications

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/I**	**External Marks**	**: 60**
Credits	**: 3**	**VSubject Code: PGMA1T02**	

Unit-I:

Probability: Sample space and events – Probability – The axioms of probability – some Elementary theorems – Conditional Probability –Baye's theorem

Unit-II:

Random variables – Discrete and continuous – distributions – Distribution function. Binomial Poisson, Normal distributions – related properties.

Unit-III:

Expectations and higher order moments. Moment generating function, and Characteristic function. Population and samples, Sampling distribution of mean (with known and unknown variance), proportion, Variances, estimation.

Unit-IV:

Statistical Inference: Introduction to null hypothesis verses alternative hypothesis. Statistical Hypothesis – Errors of type I and II errors. One tail, two-tail tests. Procedure for testing of hypothesis. Test of significance for large sampling using Z-test(i.e. single mean, difference of means & proportions.)

Test of Hypothesis (Small Samples) using student's t-test and F-test .chi-square test- Test of independence of attributes and goodness of fit.

Unit-V:

Analysis of Time series: Components of time series. Measurements of trend (i.e. semi averages, moving average, Curve fitting by Principal of least squares.) Measurement of seasonal variations (i.e. Simple averages, Ratio to Trend, Ratio to moving and link relative methods)

Curve Fitting: Method of least squares method. Fitting of Straight line, parabola, exponential curve and power curves by using the method of least squares for bivarite data

TEXTBOOKS:

1. Probability & Statistics Dr. K. Murugesan & P.Gurusamyby Anuradha Agencies, Deepti Publications.

2. Fundamentals of Applied Statistics, S C Gupta & V K Kapoor, S Chand Publications

1. Probability, Statistics and Radom Processor, T V Veerajan, TMH, India

2. Probability and Statistics for Engineers: Millerand Freund, PHI.

Accounting and Financial Management

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/I**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMB1T06**	

UNIT-I

Concept of Accounting- Features-Branches- Users and necessity of Accounting- Generally Accepted Accounting Principles (GAAP), Financial Accounting Vs. Cost Accounting Vs. Management Accounting -Role of Accountant in modern Organizations.

UNIT- II

Systems of Accounting- Double -entry System of Accounting- Basic books of accounts-journal-Ledger-trail balance–Final accounts -company final accounts (Simple Problems)

UNIT – III

Financial Management – Meaning and scope-Functions –Role- Objectives - Time Value of Money – Over Capitalization – Under Capitalization – profit maximization – wealth maximization – EPS maximization. Ratio Analysis - Advantages - Limitations –Types-calculation of Ratios.

UNIT- IV

Costing –Basic cost concepts-Elements of cost – Marginal Costing –Cost Volume Profit Analysis- Break Even Point- BE chart-Practical applications of CVP Analysis - short run decisions.

UNIT- V

Budgeting :Concept-Nature, Scope and Importance – Budget-types – Cash Budget, Sales Budget – Flexible Budget, Master Budget-Zero based budget-Budgetary Control

Text Books

1. Accounting for Managers, P. Vijaya Kumar, and Himalaya Publications.
2. Accounting for Management. VijayaKumar.TMH.
3. Financial Accounting, S.N Maheswari and S.K. Maheswari, Vikas.
4. Financial Accounting, A. Mukherjee and M. Heneef, TMH.
5. Basic Financial Accounting for Management, Ambaresh Gupta, Pearson.
6. Accounts And Finance for Non accounts, Chatterjee, D.K. Himalaya.
7. Financial Analysis and Accounting, P. PremchandBabu and M. Madam Mohan, Himalaya.
8. Essential of Financial Accounting, Ashish, K and Ballacharya, PHI.
9. Guide to Financial Management, John Tannent, Viva.

Communications Skills Lab

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/I**	**External Marks**	**: 60**
Credits	**: 2**	**Subject Code: PGBS1L01**	

Objectives: The language lab focuses computer-aided multi-media instruction and language Acquisition to achieve the following targets:

1. To expose the students to a variety of self-instructional, learner friendly modes of language learning.
2. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required facility to face computer-based competitive exams such GRE, TOEFL, GMAT etc.
3. To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
4. To train them to use language effectively to face interviews, group discussions, public speaking.
5. To initiate them into greater use of the computer in resume preparation, report writing, format-making etc.

However, depending upon the available of infrastructure and budget, the above targets can also be achieved by procuring the minimum required equipment suggested for the establishment of Conventional Lab the details of which are given below. The lab should cater to the needs of the students to build up their confidence to help them develop leadership qualities through their communicative competence.

ENGLISH LANGUAGE LABORATORY PRACTICE

1. Introduction to Phonetics. 2. Introduction to Vowels and Consonants and associated Phonetic symbols. 3. Introduction to Accent, Intonation and Rhythm. 4. Situational Dialogues/Role Play. 5. Debate 6.Public Speaking. 7. Group Discussions 8. Facing Interviews 9. Resume preparation 10. e- correspondence

MODULE	TOPICS/SUB-TOPICS	LABSESSIONS
1	INTRODUCTION TOPHONETICS-Vowels,-Consonants, -Diphthongs INTRODUCTION TO STRESS & INTONATION-Articulation, - Respiration, -Phonation	3
2	GROUP DISCUSSIONS FACING INTERVIEWS	4
3	SITUATIONAL/DIALOGUE/	2
	ROLE PLAY RESUME PREPARATION	2
4	PUBLIC SPEAKING, DEBATE	2
5	GRE,TOEFL,GMAT MODELS,e-CORRESPONDENCE	3

Suggested Software for Lab classes:

Cambridge Advanced Learners' Dictionary with exercises
The Rosetta Stone English Library Clarity Pronunciation
Power

Mastering English in Vocabulary, Grammar, Spellings, Composition
Dorling Kindersley series of Grammar, Punctuation, Composition
etc. Oxford Advanced Learner's Compass, 7th Edition
Language in Use, Foundation Books Pvt Ltd
Learning to Speak English - 4 CDs
Microsoft Encarta
Murphy's English Grammar, Cambridge
Time series of IQ Test, Brain-teasers, Aptitude Test etc.
English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

REFERENCE BOOKS:

1. The Human Touch: personal Skills for Professional Success – by DebraPaul.
2. The Definitive Book of body Language – by Allan Pease, Barbara Pease.
3. How to Face Interviews – by Clive Fletcher.s
4. The 7 Habits of Highly Effective People – by StephenCovery.
5. The Google Resume: How to Prepare of a Career and Land a Job at Apple, Microsoft.
6. Good English –by G.H Vallns
7. Better English – G.H Vallins
8. Best English – G.H. Vallins
9. How to Talk to Anyone: 92 little tricks for big success in Relationships by Leli Lowndes.
10. The leader in you - by Dale Carnagie
11. 250 Job Interview Questions You'II most likely Be Asked – by Peter veluki, Peter Verki.
12. Contemporary English Grammer, structures and Composition - by David Green.

C Programming Lab

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/I**	**External Marks**	**: 60**
Credits	**: 2**	**Subject Code: PGMC1L01**	

Exercise l.

a) Write a C program to find the sum of individual digits of a positive integer.

b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1 Subsequent terms are found by adding the preceding two terms in the sequence. Write a C Program to generate the first n terms of the sequence.

c) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

d) Write a program which checks a given integer is Fibonacci number or not.

Exercise 2.

a) Write a C program to calculate the following Sum:

b) Write a C program to find the roots of a quadratic equation.

c) Write a C program to implement Newton Raphson method for a quadratic equation

d) Write a C program to implement Newton Raphson method for a general purpose algebraic equation

Exercise3

Write C program sthat use both recursive and non-recursive functions

a) To find the factorial ofa given integer.

b) To find the GCD(greatest commondivisor)of two given integers.

c) To solve Towers of Hanoi problem.

d) Write program to calculate probability of head/tail by generating random numbers Using random()function.

Exercise 4

a) The total distance travelled by vehicle in 't' seconds is given by distance = $ut+1/2at^2$ where 'u'and 'a' are the initial velocity (m/sec.) and acceleration (m/sec^2). Write C program to find the distance travelled at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.

b) Write a C program, which takes two integer operands and one operator form the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

Exercise 5

a) Write a C program to find both the larges and smallest number in a list of integers.

b) Write a C program that uses functions to perform the following:

i) Addition of Two Matrices ii) Multiplication of Two Matrices

iii) Checking symmetricity of a square matrix. iv) Calculating transpose of a matrix in-place manner.

Exercise 6

a) Write a C program that uses functions to perform the following operations:

i) To insert a sub-string in to given main string from a given position.

ii) To delete n Characters from a given position in a given string.

b) Write a C program to determine if the given string is a palindrome or not

Exercise 7

a) Write a C program that displays the position/ index in the string S where the string T begins, or –1 if S doesn't contain T.

b) Write a C program to count the lines, words and characters in a given text.

Exercise 8

a) Write a C program to generate Pascal's triangle.

b) Write a C program to construct a pyramid of numbers.

Exercise 9

Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression: $1+x+x^2+x^3+\ldots\ldots\ldots+x^n$

For example: if n is 3 and x is 5, then the program computes 1+5+25+125. Print x, n, the sum Perform error checking. For example, the formula does not make sense for negative exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the next pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.

Exercise 10

a) 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.

b) Write a C program to convert a Roman numeral to its decimal equivalent.

Exercise 11

Write a C program that uses functions to perform the following operations using Structure:

i) Reading a complex number ii) Writing a complex number

iii) Addition of two complex numbers iv) Multiplication of two complex numbers

Exercise 12

a) Write a C program which copies one file to another.

b) Write a C program to reverse the first n characters in a file. (Note: The file name and n are specified on the command line.)

Reference Books:

1. Computer Programming in C, V. Rajaraman, PHI.
2. C Programming, E.Balagurusamy, 3rd edition, TMH.
3. Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publications.

Digital Logic & Computer System Organization Lab

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/I**	**External Marks**	**: 60**
Credits	**: 2**	**Subject Code: PGMC1L02**	

Exercise1

Boolean algebra: Theorems and logical gates, verification of truth tables

Exercise2

Realization of Boolean expressions; Using (i) AND–OR-NOT Gates (ii)NAND Gates (iii)NOR Gates

Exercise3

Latches Flip–Flops: RS, JK, T,D, Master–Slave FF, Edge–Triggered Flip–Flops

Exercise4

Counters: Binary Counter, Synchronous/Asynchronous Binary Counter, Ripple Counter, Decade Counter, Up/Down Counter

Exercise5

Modulo Counter: Modulo-5, Modulo– 10

Exercise6

Adders/Subtractors: Half Adder, Full Adder, 1‘s and 2’s complement addition

Exercise7

Multiplexers/DataSelector:2-inputand8-input, Demultiplexers, Logic Function Generator

Exercise8

Decoders and Encoders

Exercise9

BCD adders and Comparators

Exercise10

Registers: Basic Shift Register (SR), SI/SO SR, SI/PO SR, PI/SO SR, PI/PO SR

Exercise11

Johnson Counter, Sequence Generator, Parity Generators/Checkers

Exercise12

Code Converters: Decimal–to-Binary, Binary–to –Decimal, Decimal–to-Hexa Decimal, BCD-to –Decimal, Binary–to-gray, gray-to –Binary

Exercise13

Buffers/Derivers: Open; collector Buffers

Exercise14

Gates: CMOS/NMOS/TTL–Basic Operational Characteristics and parameters

Exercise15

RAM, ROM, PROM, EPROM–Testing Memory Chips

REFERENCEBOOKS

1. Digital Fundamentals, Floyd & Jain, Pearson, 2005.
2. Digital Logic and Computer Organization, Rajaraman, Radhakrishnan, PHI,2006

OOPS through JAVA

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/II**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC2T01**	

Unit –I:

Basics of Object Oriented Programming(OOP): Need for OO paradigm , A way of viewing world- Agents, responsibility, messages, methods, classes and instances, class hierarchies(Inheritance), method binding, overriding and exceptions, summary of OOP concepts, coping with complexity , abstraction mechanisms

Java Basics: Data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, classes and objects- concepts of classes, objects, constructors methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

Unit –II:

Inheritance: Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitations, combination, benefits of inheritance costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism, abstract classes.

Packages and Interfaces: Defining, Creating and Accessing a package, Understanding CLASSPATH, Importing packages, differences between classes and interfaces, defining an interface, Implementing interface, applying interfaces variables in interface and extending interfaces.

Unit –III:

Exception handling and Multithreading: Concepts of exception handling, benefits of exception handling, Termination or presumptive models, exception hierarchy, usage of try, catch, throws and finally, built in exceptions, creating own exception sub classes. Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

Unit –IV:

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, inner classes. The AWT class hierarchy , user interface components-labels, button, canvas, scrollbars, text components, check box, check box groups, choices, list panes- scroll pane, dialogs, menu bar, graphics, layout manager- layout manager types- boarder, grid, flow, card and grid bag.

Unit V:

Applets: Concepts of Applets, differences between applets and applications, lifecycle of an applet, types of applets, creating applets, passing parameters to applets.

Swings: Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons- The JButton class, Check boxes, Radio Buttons, Combo boxes, Tabbed panes, Scroll panes, Trees and Tables.

TEXTBOOKS:

1. Java-The complete reference,7/e, Herbert schildt, TMH.

REFERENCES:

1. JAVA: How to program, 8/e, Dietal ,Dietal,PHI.
2. Introduction of programming with JAVA,S.Dean,TMH.
3. Introduction to Java programming, 6/e, Y.Daniel Liang, Pearson.
4. Core Java 2, Vol 1(Vol 2) Fundamentals(Advanced), 7/e, Cay.S.Horstmann,Gary Cornell, Pearson.
5. Big Java2,3/e, Cay.S. Horstmann,Wiley.
6. Object Oriented Programming through Java, P.Radha Krishna, University Press.
7. JAVA & Object Orientation an Introduction, 2/e, John Hunt, Springer.
8. Introduction to JAVA Programming, 7/e, Y.Daniel Liang, Pearson.
9. JAVA Programming and Object –Oriented Application Development , Johnson, Cengage Learning.
10. First Encounter with JAVA, S.P.Bhuta, SPD
11. JAVA for Professionals, B.M.Harwani, SPD.
12. Program with JAVA, Mahesh Bhave, Palekan, Pearson.
13. Programming with JAVA, 3/e, E.Balaguruswamy, TMH

Operating Systems

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/II**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMAC2T02**	

Unit –I:

Introduction: Computer –system organization, Computer- system Architecture, Operating- system Structure, Operating-system Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, Special- purpose systems, Computing Environments, Operating-system Structure: , Operating-system Services, User , Operating-system Interface, System calls, System programs, , Operating-system Design and Implementation, , Operating-system structure, Virtual Machine

Unit –II:

Process Management:

Processes: Process Concept, Process Scheduling, Operations on Processes, Interprocess Communication, Examples of IPC Systems, Communication in Client-Server systems

Threads: Overview, Multithreading Models, Thread Libraries, Java Threads, Threading Issues, OS Examples

CPU Scheduling: Basic concepts, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling, Thread Scheduling, Operating system Examples

Process Synchronization: Background, The Critical- section problem, Petersons solution, Synchronization Hardware, Semaphores, Classic problems of Synchronization, Monitors, Atomic Transactions.

Unit –III:

Memory management: Main memory: Swapping, Contiguous memory Allocation, Paging, Structure of the Page table, Segmentation

Virtual memory: Background, Demand paging, copy-on-Write, Page Replacement, Allocation of frames, Thrashing, Memory-Mapped Files.

Unit –IV:

File-system Interface: Concept, Access Methods, Directory structure, File-system Mounting, File sharing, Protection

File-system Implementation: File-system Structure, Implementation, Directory Implementation, Allocation Methods, Free- Space Management, Efficiency and Performance, Recovery, Log-Structured File systems, NFS

Mass –storage Structure: Overview, Disk Structure, Disk Attachment, Disk Scheduling, Disk and swap-space Management, RAID Structure, Stable-Storage Implementation, Tertiary-Storage Structure

I/O systems: Overview, I/O Hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O requests to Hardware Operations, STREAMS, Performance

Unit- V:

Deadlocks: System model, Deadlock Characterization, Methods for handling Deadlocks, Deadlock Prevention, Deadlock avoidance Deadlock Detection and Recovery form Deadlock.

Protection: Goals of Protection, Principles of protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability –Based systems, Language-Based Protection

Security: The Security Problem, Program Threads, System and Network Threats, Cryptography as a security tool, User Authentication, Implementing security Defenses, Firewalling to protect systems and Networks.

TEXTBOOKS:

1. Operating system concepts, 7/e, Abraham Siliberschatz, Galvin, John Wiley &sons , Inc.

REFERENCES:

1. Operating systems,6/E,Williamstallings, PHI/Pearson.
2. Operating systems 3/e,Dietal ,Dietal,Pearson.
3. Operating systems, 2/e, Dhamdhere,TMH.
4. An introduction to Operating systems, Concepts and practice, Pramod Chandra P.Bhat,PHI
5. Operating systems, Elmasri,Carrick,Levine,TMH.
6. Operating systems ,3/e ,Nutt,Chaki,Neogy,Pearson.
7. Operating systems, Brian L.Stuart,Cengage.
8. Operating systems, Haldar, Aravind, Pearson.
9. Operating systems, PAL Choudhury, PHI.
10. Operating systems :design and Implementation, 3/e,Tanenbaum, Woodhull.

Data Structures using C

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/II**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC2T03**	

UNIT - I

Data Structures: Introduction to Data Structures – Time Complexity – Space Complexity – Pattern matching – naive method – Robin Karp Algorithm - Searching – Linear and binary search methods, sorting – Bubble sort, selection sort, Insertion sort, Quick sort, merge sort.

UNIT - II

Dynamic Memory allocation, Linked List- Single Double Linked List, Circular Linked List – Implementation of various operations, Applications of Linked Lists: Polynomials, Sparse Matrix.

UNIT - III

Stack and Queues: Definition, representation, Applications, Infix to postfix conversion using stacks, Evaluation of Postfix expressions using stacks, Operations on Stacks and Queues, Circular Queues, DEQueues and Priority Queues.

UNIT - IV

Trees- Terminology, Binary trees representation and Tree traversals, Expression trees, BST and operations on BST, Heap and Heap sort, Threaded binary trees.

UNIT - V

Graphs – Terminology, Graph representation, Graph traversals-DFS, BFS, Dijkstra's, Warshall's and Floyd's algorithms, Minimum Cost spanning trees-Prim's and Kruskal's algorithms.

TEXT BOOK

1. Fundamentals of Data structures by Horowitz &Sahani, Galgotia, 1st Edition.

REFRENCES

1. Introduction to Data structures with applications, Jean Paul Trembly & Paul G.Sorenson Second Edition, TMH.
2. Data structures using C and C++, Langsam, Augenstein and Tenenbaum, PHI.
3. Problem solving with C++, the OOP 4th Edition W.Savitch, Pearson Education.
4. Schaum's outline series – Theory and Problems of Data Structures by Seymour and Lipschutz, MGH International Edition.
5. Schaum's outlines Data structures with C++ John R. Hubbard

Perspectives of Organization and Management

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/II**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMB2T08**	

Unit – I

Introduction to Management: Concepts, Nature and Definitions of Management – Management and administration, Principles of Management - Functions of Management- Planning, Organizing, Directing and Controlling – Importance of Management.

Unit – II

Classical Theories of Organization: Functional approach – Division of labor, Levels of authority, Span of Control, Authority &responsibility, Efficiency of Management. Concept of organization structure- Formal and Informal organization, Difficulties due to Informal Organization- Group Behaviour- Committee- Motivation and theories of Motivation.

Unit –III

Human Resource Management: Objectives, Functions of HRM, Duties and Responsibilities of HR Manager- Position of HR Department in the Organization. Job Description, Job specification, Recruitment and selection, Interviewing techniques, transfers, Promotion and its Policies.

Training and Development: Identifying trainings needs –training Methods- on the Job training – Off the Job training –job Evaluation methods.

Unit-IV

Communication: Importance of Communication, Communication process-Methods of Communication two way Communication, Barriers of Communication, Organizational barriers – Essentials of Effective Communication System

Unit-V

Leadership and Strategic Management : Leadership Theories and Styles-Managerial Grid. Introduction to Strategic Management – Environmental Scanning-Internal Environment and External Environment-SWOT analysis- Challenges' in LPG.

Text Books:

1. Organization Structure and personal Management, 2/e, Subbarao. P, HPH.

2. Personal and Human Resource Management, Recenzo, Robins, PHI.

3 .Business Communications and soft skills, kuberudu B, and Krishna K.s, Excel publications.

4. Management process and Organizational Behaviour, karam pal, I.k.int.

5. Management process an d Organizational Behaviour, karam pal, I.K int.

Operations Research

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/II**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMA2T01**	

UNIT –I

Development: Definition, Characteristics and Phases of OR, Types of models (Iconic model, analog model, symbolic or mathematical models).

Allocation: Introduction, Linear Programming formulation, graphical solution, simplex method, Artificial Variable Technique (two phase method & Big M method). Duality Principle.

UNIT –II

Transportation Problem: Formulation, optimal solution; unbalanced transportation – Degeneracy.

Replacement: Introduction, replacement of items that deteriorate with time when money value is not counted and counted, individual and group replacement of items..

UNIT –III

Assignment problem: Formulation, Optimal Solution, Variants Problems.

Sequencing: Introduction, Optimal solution for processing each of n jobs through two machines, travelling salesman problem (i.e.) shortest acyclic route models.

UNIT –IV

Project Management: PERT and CPM, difference between PERT and CPM, PERT/CPM network components and precedence relations, Time estimates for activities.

Queuing theory: Introduction, Queuing system, elements of queuing operating system. M/M/1 model and simple problem

UNIT –V

Theory of Games: Introduction, minmax(maximin), criterion and optimal strategy solution of games with saddle points, rectangular games without saddle points. 2x2 games – dominance principle –mx2 & 2xn games – graphical method

TEXT BOOKS:

1. Operations Research, S.D.Sharma, Ramnath,&Kedarnath co, Meerut.
2. Operations Research, P.K.Gupta, D.S. Hira, S.Chand

REFERENCES:

1. Operations Research, Problems &sollutons, 3/e, JKSharma, Macmillan

OOPS through JAVA Lab

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/II**	**External Marks**	**: 60**
Credits	**: 2**	**Subject Code: PGMC2L01**	

I. Use JDK 1.5 or above on any platform e.g. Windows or Unix.

II. Student is expected to complete any 16 programs.

1. The Fibonacci sequence is defined by the following rule. The first 2 values in the sequence are 1, 1.every subsequent value is the sum of the 2 values preceding it. Write A Java Program (WAJP) that uses both recursive and nonrecursive functions to print the n^{th} value of the Fibonacci sequence.
2. WAJP to demonstrate wrapper classes and to fix the precision.
3. WAJP that prompts the user for an integer and then prints out all the prime numbers up to that Integer.
4. WAJP that checks whether a given string is a palindrome or not. Ex. MALAYALAM is a palindrome.
5. WAJP for sorting a given list of names in ascending order.
6. WAJP to check the compatibility for multiplication, if compatible multiply two matrices and find its transpose.
7. WAJP that illustrates how runtime polymorphism is achieved.
8. WAJP to create and demonstrate packages.
9. WAJP, using String Tokenizer class, which reads a line of integers and then displays each integer and the sum of all integers.
10. WAJP that reads on file name form the user then displays information about whether the file exists, whether the file is readable/writable, the type of file and the length of the file in bytes and display the content of the using FileInputStream class.
11. WAJP that displays the number of characters, lines and words in a text/text file.
12. Write an Applet that displays the content of a file.
13. WAJP that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +-*?% operations. Add a text field to display the result.
14. WAJP for handling mouse events.
15. WAJP demonstrating the life cycle of a thread.
16. WAJP that correctly implements Producer-Consumer problem using the concept of Inter Thread Communication.
17. WAJP that lets users create Pie charts. Design your own user interface(with Swings & AWT).
18. WAJP that allows user to draw lines, rectangles and ovals.
19. WAJP that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result and then sends the result back to the client. The client displays the result on the console. For ex: The data send form the client is the radius of a circle and the result produced by the server is the area of the circle.

20. WAJP to generate a set of random numbers between two numbers x1 and x2, and x1>0.
21. WAJP to create an abstract class named shape, that contains an empty method named numberOfSides(). Provide three classes named Trapezoid, Triangle and Hexagon, such that each one of the classes contains only the method numberOfSides(), that contains the number of sides in the given geometrical figure.
22. WAJP to implement a Queue, using user defined Exception Handling (also make use of throw, throws).
23. WAJP that creates 3 threads by extending Thread class. First thread displays “Good Morning” every 1 sec, the second thread displays “Hello” every 2 seconds and the third displays “Welcome” every 3 seconds. (Repeat the same by implementing Runnable).
24. Create an inheritance hierarchy of Rodent, Mouse, Gerbil, Hamster etc. In the base class provide methods that are common to all Rodents and override these in the derived classes to perform different behaviours, depending on the specific type of Rodent. Create an array of Rodent, fill it with different specific types of Rodents and call your base class methods.

Data Structures using C Lab

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA I/II**	**External Marks**	**: 60**
Credits	**: 2**	**Subject Code: PGMC2L02**	

LIST OF EXPERIMENTS

Implement the following programs using C language.

1. Implement Linear and Binary Search mechanisms.

2. Sort the given list of numbers using

a) Selection Sort b) Bubble Sort c) Insertion Sort d) Merge sort e) Quick sort

3. Create a single linked list and implement the following operations:

a) Insert a node at specific position

b) Delete a node from a specific position

c) Counting the nodes

d) Reversing the linked list

4. Create a Double linked list and implement the following operations:

a) Insert a node at specific position

b) Delete a node from a specific position

c) Counting the nodes

d) Reversing the linked list

5. Implement PUSH and POP operations on Stacks using Arrays. Handle the OVERFLOW and UNDERFLOW problems also.

6. Implement PUSH and POP operations on Stacks using Linked List. Handle the OVERFLOW and UNDERFLOW problems also.

7. Implement Insertion and Deletion operations on Queues using Arrays. Handle the OVERFLOW and UNDERFLOW problems also.

8. Implement Insertion and Deletion operations on Queues Linked List. Handle the OVERFLOW and UNDERFLOW problems also.

9. Implement Insertion and Deletion operations on Queues using Arrays and Linked List. Handle the OVERFLOW and UNDERFLOW problems also.

10. Write program to create a BST and traverse it in Inorder, Preorder and Post order.

11. Write a program to count the number of leaf nodes in a Binary tree.

12. Write a program to find the Path Matrix of a graph using Warshall's algorithm.

13. Implement BFS and DFS traversal techniques on a given graph.

14. Write a program to find the All Pairs Shortest Path matrix using Floyd's.

DATABASE MANAGEMENT SYSTEMS

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/III**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC3T01**	

UNIT - I

Database System Applications, Purpose of Database Systems, View of Data, Data Abstraction, Instances and Schemas, Data Models – ER Model, Relational Model, Other Models, Database Languages, DDL, DML. Data Storage and Querying, Database Architecture, Database Users and Administrators. Introduction to Data base design, Database Design and ER diagrams, Entities, Attributes and Entity sets, Relationships and Relationship sets, additional features of ER Model. Relational Model: Introduction to the Relational Model, Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design, Introduction to Views.

UNIT - II

Relational Algebra and Calculus: Relational Algebra, Selection and Projection, Set operations, Renaming, Joins, Division, Examples of Algebra Queries, Relational calculus, Tuple relational Calculus – Domain relational calculus. Form of Basic SQL Query, Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries, Set, Comparison Operators, Aggregate Operators, NULL values, Comparison using Null values, Logical connectives, AND, OR and NOT, Impact on SQL Constructs, Outer Joins, Disallowing NULL values, Complex Integrity Constraints in SQL.

UNIT - III

Introduction to Schema Refinement – Problems Caused by redundancy, Decompositions

– Problem related to decomposition, Functional Dependencies - Reasoning about FDS, Normal Forms – FIRST, SECOND, THIRD Normal forms – BCNF –Properties of Decompositions- Loss less join Decomposition, Dependency preserving Decomposition, Schema Refinement in Data base Design – Multi valued Dependencies – FOURTH Normal Form.

UNIT - IV

Overview of Transaction Management: The ACID Properties, Transactions and Schedules, Concurrent Execution of Transactions, Lock Based Concurrency Control-Strict 2PL, Deadlocks. Introduction to Lock Management, Lock Conversions, Dealing with Dead

Locks, Concurrency Control without Locking. Crash recovery: Introduction to Crash recovery, Introduction to ARIES, the Log, and Other Recovery related Structures, the Write-Ahead Log Protocol, Check pointing.

UNIT - V

Indexing, Clustered Indexes, Primary and Secondary Indexes. Tree Structured Indexing: Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM) B+ Trees: A Dynamic Index Structure, Search, Insert, and Delete. Hash Based Indexing: Static Hashing, Extendable hashing, Linear Hashing.

TEXT BOOKS:

1. Data base Management Systems, Raghu Rama krishnan, Johannes Gehrke, TMH, 3rd Edition, 2003.
2. Data base System Concepts, A.Silberschatz, H.F. Korth, S.Sudarshan, McGraw hill, VI edition, 2006.

REFERENCE BOOKS:

1. Database Management System Oracle SQL and PL/SQL, P.K.DasGupta, PHI.
2. Database System Concepts, Peter Rob & Carlos Coronel, Cengage Learning,2008.
3. Database Systems, A Practical approach to Design Implementation and Management Fourth edition, Thomas Connolly, Carolyn Begg, Pearson education.
4. Database Principles, Programming, and Performance, P.O'Neil, E.O'Neil, 2nd ed.,
    a. ELSEVIER
5. Fundamentals of Relational Database Management Systems, S.Sumathi, S.Esakkirajan, Springer.
6. Introduction to Database Systems, C.J.Date, Pearson Education

COMPUTER COMMUNICATIONS

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/III**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC3T02**	

UNIT -I

The OSI Reference Model, The TCP/IP Reference Model , A Comparison of the OSI and TCP/IP Reference Models, Magnetic Media , Twisted Pair , Coaxial Cable, Fiber Optics. Data Link Layer Design Issues - Services Provided to the Network Layer , Framing , Error Control , Flow Control , Error-Correcting Codes, Error-Detecting Codes, An Unrestricted Simplex Protocol , A Simplex Stop-and-Wait Protocol , A Simplex Protocol for a Noisy Channel, A One-Bit Sliding Window Protocol , A Protocol Using Go Back N , A Protocol Using Selective Repeat.

UNIT- II

Static Channel Allocation in LANs and MANs, Dynamic Channel Allocation in LANs and MANs, ALOHA, Carrier Sense Multiple Access Protocols, Collision-Free Protocols. Ethernet Cabling, Manchester Encoding, The Ethernet MAC Sub layer Protocol , The Binary Exponential Backoff Algorithm , Ethernet Performance , IEEE 802.2: Logical Link Control. 802.3, 802.4, 802.5

UNIT- III

Network Layer Design Issues **-** Store-and-Forward Packet Switching, Services Provided to the Transport Layer, Implementation of Connectionless Service, Implementation of

Connection-Oriented Service , Comparison of Virtual-Circuit and Datagram Subnets, The Optimality Principle

Routing Algorithms **-** Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing.

Congestion Control Algorithms - General Principles of Congestion Control, Congestion Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets, Load Shedding, Jitter Control, How Networks Differ, How Networks can be Connected, Concatenated Virtual Circuits, Connectionless Internetworking, Tunneling, Internetwork Routing, Fragmentation. The IP Protocol - IP Addresses, Internet Control Protocols, IPv6

UNIT -IV

Elements of Transport Protocols - Addressing, Establishing a Connection, Releasing a Connection, Flow Control and Buffering, Multiplexing, Crash Recovery; UDP, RPC;

TCP - Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, Modeling TCP Connection Management, TCP Transmission Policy, TCP Congestion Control

UNIT-V

DNS-The DNS Name Space, Resource Records, Name Servers

E MAIL - Architecture and Services, The User Agent, Message Formats, Message Transfer, Final Delivery

WWW - Architectural Overview, Static Web Documents, Dynamic Web Documents, HTTP, MIME

TEXT BOOKS :

1. Computer Networks, Andrew Tanenbaum, 4/e, Pearson

Reference Books :

1. Data communications and networking Forouzan, 4/e, TMH
2. Data and computer communications, stallings, 8/e, PHI
3. Computer Networks – A System Approach , Peterson ,Bruce Davie,2/ e,Harcourt Asia
4. Compute communications and networking technologies, Gallo, Hancock,Cengage
5. An Engineering approach to compute networking, Kesha ,Pearson
6. Communication networks, 2/e , Leon-Garcia, TMH
7. Computer networks , AnuranjanMisra, ACME Learning
8. Computer networks, C R Sarma, Jaico, Understanding data communications, Held, 7/e , Pearson

DESIGN AND ANALYSIS OF ALGORITHMS

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/III**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC3T03**	

UNIT-I:

Introduction: Algorithm, Psuedo code for expressing algorithms, performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic Analysis. Disjoint Sets - disjoint set operations, union and find algorithms, spanning trees, connected components and bi-connected components.

UNIT-II:

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort,

Strassen's matrix multiplication. Greedy method: General method, applications-Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT-III:

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT-IV:

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

UNIT-V:

Branch and Bound: General method, applications - Travelling sales person problem,0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution. NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Cook's theorem.

TEXT BOOKS:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Universities Press.
2. The Algorithm Design Manual, 2nd edition, Steven S. Skiena, Springer.
3. Introduction to Algorithms, second edition, T.H.Cormen, C.E.Leiserson, R.L.Rivest and C.Stein, PHI Pvt. Ltd.

REFERENCE BOOKS:

1. Introduction to the Design and Analysis of Algorithms, AnanyLevitin, PEA
2. Design and Analysis of Algorithms, Parag Himanshu Dave, Himansu B Alachandra Dave, Pearson Education.
3. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T. Lee, S.S.Tseng, R.C.Chang and T.Tsai, McGraw Hill.
4. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.

UNIX PROGRAMMING

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/III**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC3T04**	

Unit - I

History of UNIX operating system, structure of Unix, features of Unix, Unix file system, internal structure of file system, internal and external commands, directory commands, File Processing Commands.

Unit - II

Protection and security commands, communication commands, information processing commands, process management commands, I/O redirection.

Shell programming: shell variables, positional parameters, decision control structures, loop control structures, set statement, shift statement, command grouping.

Unit – III

File and directory maintenance: file access functions-open, crate, read, write, close, file control functions-fcntl, lseek, stat, lstat, fstat, dup, ioctal, directory maintenance-chmod, chown, link, unlink, symlink, mkdir, rmdir, chdir,getcwd.

Process: process structure, fork(), wait(), vfork(), orphan process, zombie process, waitpid(), getpid(), getppid().

Unit - IV

Memory management, file and record locking, signals-signal(), kill(), raise(), alaram(), pause(), sleep(), abort(), inter process communication-communication among unix processes, pipes, named pipes.

Unit - V

Message queues: message structure, creating a message queue, writing message onto message queue, reading messages from message queue, controlling message queue operations.

Shared memory: allocating a shared memory segment, attaching and detaching a shared memory segment, placing data in a shared memory, destroying a shared memory segment.

Semaphores: creating a semaphore set, setting and getting semaphore values, using semaphore for mutual exclusion.

Text Books:

1. Unix Programming the first drive- Kumar Saurabh
2. UNIX concepts and applications-Sumitahba Das, TMH, 3/E.

Reference Books:

1. Introduction to unix and shell programming – M.G. VenkateshMurthy
2. Unix and shell programming- N B Venkateswaralu.
3. Unix and shell programming- Stephen G kochan, Patrick wood, Pearson,3/E.

SOFTWARE ENGINEERING

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/III**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC3T05**	

UNIT – I

The software problem: Cost, schedule and quality, Scale and change.

Software Processes: Process and project, component software processes, Software development process models : Waterfall model, prototyping, iterative development, relational unified process, time boxing model, Extreme programming and agile process, using process models in a project. Project Management Process.

UNIT – II

Software requirement analysis and specification: Value of good SRS, requirement process, requirement specification, functional specifications with use cases, other approaches for analysis, validation.

Planning a software project: Effort estimation, project schedule and staffing, quality planning, risk management planning, project monitoring plan, detailed scheduling.

UNIT – III

Software Architecture: Role of software architecture, architecture views, components and connector view, architecture styles for C & C view, documenting architecture design, evaluating architectures.

Design: Design concepts, function-oriented design, object-oriented design, detailed design, verification, and metrics

UNIT- IV

Coding and Unit Testing: Programming principles and guidelines, incrementally developing code, managing evolving code, unit testing, code inspection, metrics.

Unit - V

Testing: Testing concepts, Testing Process, Black-Box Testing, White-Box Testing, and Metrics.

TEXT BOOKS:

1. Software Engineering, A Precise approach, PankajJalote, Wiley-India

REFERENCE BOOKS:

1. Software Engineering, 3/e ,& 7e Roger S.Pressman , TMH
2. Software Engineering, 8/e, Sommerville, Pearson.
3. Software Engineering principles and practice, W S Jawadekar, TMH
4. Software Engineering concepts, R Fairley, TMH

Database Management Systems Lab

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/III**	**External Marks**	**: 60**
Credits	**: 2**	**Subject Code: PGMC3L01**	

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1. Create table for various relations.
2. Implement the query in SQL for a) insertion b) retrieval c) updation d) deletion
3. Execute a single line and group functions for a table.
4. Execute DCL and TCL Commands.
5. Create and manipulate various DB objects for a table.
6. Create views, partitions and locks for a particular DB.
7. Write PL/SQL procedure for an application using exception handling.
8. Write PL/SQL procedure for an application using cursors.
9. Write a PL/SQL program for an application using functions.
10. Write a PL/SQL block for transaction operations of a typical application using triggers.
11. Write a PL/SQL block for transaction operations of a typical application using package.
12. Implementing operation on relations using PL/SQL
13. Writing Assertions.
14. Generating Forms
15. Generating Reports

UNIX PRGRAMMING LAB

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/III**	**External Marks**	**: 60**
Credits	**: 2**	**Subject Code: PGMC3L02**	

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1. Information processing commands.
2. File processing commands.
3. Directory processing commands.
4. Text processing commands.
5. Program using system calls: **create**, **read**, **write**, **close**, **stat**, **fstat**, **lseek**.
6. Create two processes to run a **for loop**, which adds numbers **1** to **n**, say one process adds odd numbers and the other even.
7. Create a file that is shared among some users, write a program that finds whether a specific user has created read and write operations on the file.
8. Write a program demonstrating semaphore operation on a shared file for reading but not writing.
9. Write a program which reads a source file name and destination file name using command line arguments and then converts into specified format (i.e. either from lower case to upper case or upper case to lower case or inverse of each).
10. Write a program which takes set of file names along with the command line and print them based on their ascending or descending order.
11. Write a program which takes directory name along the command line and displays names of the files which are having more than one link.
12. Write a program to demonstrate the use of exec() family functions.
13. Write a program to display the good morning, good afternoon, good evening and good night depending on the users log on time.
14. Write a program to demonstrate the locking mechanism while accessing the shared files.
15. Write a shell script which works similar to wc command. This script can receive the option –l, -w, -c to indicate whether number of lines/words/characters.

16. Write a program to print prime numbers between **x** and **y**.
17. Write a shell script which deletes all lines containing the word ”**UNIX**” in the files supplied as arguments to this shell script.
18. Write a shell script which displays a list of all files in current directory to which you have read. Write and execute permissions.
19. Write a menu-driven program.
20. Program to implement inter process communication using pipes.
21. Write a program which demonstrates the shared memory functions.
22. Write a program which demonstrates the message queue functions.

DATA WAREHOUSING AND DATA MINING

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/IV**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC4T01**	

UNIT - I

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems,

Data Preprocessing: Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

Data Mining Primitives, Languages, and System Architectures : Data Mining Primitives, Data Mining Query Languages, Designing Graphical User Interfaces Based on a Data Mining Query Language Architectures of Data Mining Systems.

UNIT - II

Data Warehouse and OLAP: Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data Warehousing to Data Mining.

Concepts Description, Characterization and Comparison: Data Generalization and Summarization- Based Characterization, Analytical Characterization: Analysis of Attribute **Relevance, Mining Class Comparisons**: Discriminating between Different Classes.

UNIT - III

Mining Association Rules in Large Databases : Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT - IV

Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, and Classification by Back propagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, and Classifier Accuracy.

UNIT - V

Cluster Analysis Introduction: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, and Partitioning Methods- K means, K mediods, Hierarchical methods- single link, complete link, average link agglomerative clustering methods, Density-Based Methods-DBSCAN.

Mining Complex Types of Data: Multidimensional Analysis and Descriptive Mining of Complex, Data Objects, Mining Multimedia Databases, Mining Text Databases, Mining the World Wide Web.

TEXT BOOKS :

1. Data Mining, Concepts and Techniques, Jiawei Han, Micheline Kamber, Harcourt India.

REFERENCE BOOKS :

1. Introduction to data mining Pang-Ning Tan, Vipin Kumar, Michael Steinbacn, Pearson
2. Data Mining Techniques, Arun K Pujari, University Press.
3. Data Warehousing Fundamentals, PaulrajPonnaiah, Wiley.
4. The Data Warehouse Life cycle Tool kit, Ralph Kimball, Wiley.

ADVANCED JAVA AND WEB TECHNOLOGIES

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/IV**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC4T02**	

UNIT- I

HTML5: Common tags, HTML Tables and formatting internal linking, Complex HTML forms.

Scripting Languages: Java Scripts, Control structures, functions, arrays & objects, DHTML, CSS, event model, filters & transitions.

UNIT- II

Introduction to PHP: operators and flow control, strings and arrays, functions, reading data in web pages

UNIT-III

Introduction to Servelets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servlet Package, Reading Servlet parameters, Reading Initialization Parameters, The javax.servlet.HTTP package, Handling Http Request & responses, Cookies.

Introduction to JSP: The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC.

UNIT-IV

JSP Application Development: Generating Dynamic Content, Using Scripting Elements, Implicit JSP Objects, Conditional Processing – Displaying Values, Using an Expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Passing Control and Data Between Pages – Sharing Session and Application Data Memory Usage Considerations.

UNIT-V

Database Access: Database Programming using JDBC, Studying Java.sql.* package. Accessing a Database from a JSP Page; Accessing a Database from a PHP Page-Insert newdata items into a database, update records, delete records.

TEXT BOOKS:

1. Internet and World Wide Web: How to program,6/e, Dietel, Dietel, Pearson.
2. The Complete Reference Java2, 8/e, Patrick Naughton, Herbert Schildt, TMH.
3. The Complete Reference PHP, Steven Holzner

REFERENCE BOOKS:

1. Web Programming, building internet applications, 2/e, Chris Bates, Wiley Dreamtech
2. Programming world wide web, Sebesta, PEA
3. Web Tehnologies, 2/e, Godbole, kahate, TMH
4. An Introduction to web Design , Programming ,Wang,Thomson

SOFTWARE TESTING METHODOLOGIES

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/IV**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC4T03**	

UNIT-I

Introduction:- Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs Flow graphs and Path testing:- Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT-II

Transaction Flow Testing:-transaction flows, transaction flow testing techniques. Dataflow testing:- Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT-III

Domain Testing:-Domains and Paths, Nice & Ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

UNIT-IV

Paths, Path products and Regular expressions:- path products & path _expression, reduction procedure, applications, regular expressions & flow anomaly detection. Logic Based Testing:- overview, decision tables, path expressions, kv charts, specifications.

UNIT-V

State, State Graphs and Transition testing:- state graphs, good & bad state graphs, state testing, Testability tips. Graph Matrices and Application:-Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.

TEXT BOOKS:

1. Software testing techniques - Boris Beizer, International Thomson computer press, second edition.
2. Software Testing- Yogesh Singh, CAMBRIDGE

REFERENCE BOOKS:

1. Introduction to Software Testing, Paul Amman, Jeff Offutt, CAMBRIDGE
2. Effective Software testing, 50 Specific ways to improve your testing, Elfriede Dustin, PEA

ELECTIVE – I

HUMAN COMPUTER INTERACTION

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/IV**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC4TE1**	

UNIT - I

Introduction: Importance of user Interface, definition, importance of good design. Benefits of good design. A brief history of Screen designs

The graphical user interface: Popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user –interface popularity, characteristics- Principles of user interface.

UNIT - II

Design Process: Human interaction with computers, importance of human characteristics, human consideration, Human interaction speeds, understanding business junctions.

UNIT – III

Screen Designing : Design goals, Screen planning and purpose, organizing screen elements, ordering of screen data and content, screen navigation and flow, Visually pleasing composition, amount of information, focus and emphasis, presentation information simply and meaningfully, information retrieval on web, statistical graphics, Technological consideration in interface design.

UNIT - IV

Windows: Windows new and Navigation schemes selection of window, selection of devices based and screen based controls. Components: Components text and messages, Icons and increases, Multimedia, colors, uses problems, choosing colors.

UNIT - V

Software tools: Specification methods, interface, Building Tools. Interaction Devices: Keyboard and function keys, pointing devices, speech recognition digitization and generation, image and video displays, drivers.

TEXT BOOKS:

1. The Essential guide to user interface design,2/e, Wilbert O Galitz, Wiley DreamaTech.

REFERENCE BOOKS:

1. Human Computer Interaction. 3/e, Alan Dix, Janet Finlay, Goryd, Abowd, Russell Beal, PEA,2004
2. Designing the user interface. 4/e, Ben Shneidermann , PEA.
3. User Interface Design, SorenLauesen , PEA.
4. Interaction Design PRECE, ROGERS, SHARPS, Wiley .
5. Human Computer, Interaction Dan R.Olsan, Cengage ,2010.

ELECTIVE – I

ERP & SUPPLY CHAIN MANAGEMENT

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/IV**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC4TE2**	

UNIT - I

Introduction to ERP: Overview – Benefits of ERP, ERP and Related Technologies, Business Process Reengineering, Data Warehousing, Data Mining – On–line Analytical Processing, Supply Chain Management. ERP Implementation: Implementation Life Cycle, Implementation Methodology, Hidden Costs, Organizing Implementation, Vendors, Consultants and Users, Contracts, Project Management and Monitoring.

UNIT – II

Business Modules: Business Modules in an ERP Package, Finance, Manufacturing, Human Resource, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution.

Fundamentals of Supply Chain Management: Supply chain networks, Integrated supply chain planning, Decision phases in supply chain, process view of a supply chain, supply chain flows, Overview of supply chain models and modeling systems.

Supply chain planning: Strategic, operational and tactical, Understanding supply chain through process mapping and process flow chart.

UNIT - III

SCM Strategies, Performance: Supply chain strategies, achieving strategic fit, value chain, Supply chain drivers and obstacles, Strategic Alliances and Outsourcing, purchasing aspects of supply chain.

Supply chain performance measurement: The balanced score card approach, Performance Metrics.

Planning demand and supply: Demand forecasting in supply chain, Aggregate planning in supply chain, Predictable variability.

UNIT - IV

Planning and Managing Inventories: Introduction to Supply Chain Inventory Management.

Inventory theory models: Economic Order Quantity Models, Reorder Point Models and Multiechelon Inventory Systems, Relevant deterministic and stochastic inventory models and Vendor managed inventory models.

Distribution Management: Role of transportation in a supply chain - direct shipment, warehousing, cross-docking; push vs. pull systems; transportation decisions (mode selection, fleet size), market channel structure, vehicle routing problem. Facilities decisions in a supply chain. Mathematical foundations of distribution management, Supply chain facility layout and capacity planning.

UNIT-V

Strategic Cost Management in Supply Chain: The financial impacts, Volume leveraging and cross docking, global logistics and material positioning, global supplier development, target pricing, cost management enablers, Measuring service levels in supply chains, Customer Satisfaction/Value/Profitability/Differential Advantage.

TEXT BOOKS:

1. ERP Demystified, 2/e, Alexis Leon, TMH, 2007.
2. Supply Chain Management: Strategy, Planning, Operation, Sunil Chopra, Peter Meindel, PEA, 2002.

ELECTIVE – I

MOBILE COMPUTING

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/IV**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC4TE3**	

UNIT - I

Mobile Communications: An Overview- Mobile Communication-guided transmission, unguided transmission- signal propagation frequencies, antennae, modulation, modulation methods and standards for voice-oriented data communication standards, modulation methods and standards for data and voice communication, mobile computing- novel applications and limitations, mobile computing architecture, mobile system networks.

UNIT - II

Mobile devices and systems: Cellular networks and frequency reuse, Mobile smart phones, Smart mobiles and systems, Hand held pocket computers, Handheld devices, Smart systems, Limitations of mobile devices.

GSM and other 2G Architectures: GSM-services and system architecture, Radio interfaces of GSM, Protocols of GSM, Localization, Call handling, GPRS system architecture. Wireless medium access control, CDMA, 3G, and 4G communication: Modulation, Multiplexing, Controlling the medium access, Spread spectrum, Coding methods.

UNIT - III

Mobile IP Network layer: IP and Mobile IP network layers: OSI layer functions, TCP/IP and Internet protocol, Mobile internet protocol; Packet delivery and Handover Management; Location Management: Agent Discovery; Mobile TCP Introduction to Mobile Adhoc network: fixed infrastructure architecture, MANET infrastructure architecture; MANET: properties, spectrum, applications; Security in Ad-hoc network; Wireless sensor networks; sensor network applications.

UNIT - IV

Synchronization: Synchronization in mobile computing systems, Usage models for Synchronization in mobile application, Domain-dependant specific rules for data synchronization, Personal information manager, synchronization and conflict resolution strategies, synchronizer; Mobile agent: mobile agent design, aglets; Application Server

UNIT - V

Mobile Wireless Short Range Networks and Mobile Internet: Wireless networking and wireless LAN, Wireless LAN (WLAN) architecture, IEEE 802.11protocol layers, Wireless application protocol (WAP)-WAP1.1 architecture, wireless datagram protocol (WDP), Wireless Transport Layer Security (WTLS), wireless transaction and session layers, wireless application environment.

TEXT BOOKS:

1. RAJ KAMAL, “Mobile Computing,” second edition, Oxford.

REFERENCE BOOKS:

1. ASOKE K TALUKDER, HASAN AHMED, ROOPA R YAVAGAL, “Mobile omputing, Technology Applications and Service Creation” Second Edition, McGraw Hill.
2. UWE Hansmann, LotherMerk, Martin S. Nocklous, Thomas Stober, “Principles of Mobile Computing,” Second Edition, Springer

ELECTIVE – II

COMPUTER GRAPHICS

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/IV**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC4TE4**	

UNIT - I

Introduction: Application areas of Computer Graphics, Overview of Graphics Systems: video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices.

Output primitives : Points and lines, line drawing algorithms: DDA, Bresenhams, Mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT-II

2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.(p.nos 204-227 of text book-1).
2-D viewing : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, Cohen-Sutherland and Liang-Barsky line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm

UNIT- III

3-D Object Representation : Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and Surfaces. Basic illumination models. 3-D Geometric transformations: Translation, Rotation, scaling, reflection and shear transformations, composite transformations.

UNIT - IV

3-D Viewing : Viewing pipeline, Viewing Coordinates, View Volume, Projections: Parallel Projection, Perspective Projections Clipping.

Visible Surface Detection Methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, Area Sub-division and Octree methods

UNIT - V

Computer Animation: Design of Animation Sequence, General Computer Animation Functions, Raster Animation, Computer Animation Languages, Key Frame Systems, Motion Specifications.

TEXT BOOKS:

1. Computer Graphics C version, Donald Hearn, M.Pauline Baker, Pearson

REFERENCE BOOKS:

1. Computer Graphics Principles & practice, 2/e, Foley, VanDam, Feiner, Hughes, Pearson
2. Computer Graphics, Zhigandxiang, Roy Plastock, Schaum's outlines, 2/E, TMH
3. Procedural elements for Computer Graphics, David F Rogers, 2/ e, TMH
4. Principles of Interactive Computer Graphics, Neuman ,Sproul, TMH.
5. Principles of Computer Graphics, ShaliniGovil, Pai, 2005, Springer.
6. Computer Graphics, Steven Harrington, TMH
7. Computer Graphics, Shirley, Marschner, Cengage
8. Computer Graphics, Rajesh Maurya, Wiley, india
9. Computer Graphics PradeepBhatiya, IK intentional

ELECTIVE – II

ARTIFICIAL INTELLIGENCE

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/IV**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC4TE5**	

UNIT - I

Introduction to artificial intelligence: Introduction ,history, intelligent systems, foundations of AI, applications, tic-tac-toe game playing, development of AI languages, current trends in AI Problem solving: state-space search and control strategies : Introduction, general problem solving, characteristics of problem, exhaustive searches, heuristic search techniques, iterative-deepening a*, constraint satisfaction

UNIT - II

Problem reduction and game playing: Introduction, problem reduction, game playing, alpha-beta pruning, two-player perfect information games Logic concepts: Introduction, propositional calculus, proportional logic, natural deduction system, axiomatic system, semantic tableau system in proportional logic, resolution refutation in proportional logic, predicate logic

UNIT - III

Knowledge representation: Introduction, approaches to knowledge representation, knowledge representation using semantic network, extended semantic networks for KR, knowledge representation using frames advanced knowledge representation techniques: Introduction, conceptual dependency theory, script structure, cyc theory, case grammars, semantic web.

UNIT - IV

Expert system and applications: Introduction phases in building expert systems, expert system versus traditional systems, rule-based expert systems blackboard systems truth maintenance systems, application of expert systems, list of shells and tools

UNIT - V

Uncertainty Measure: probability theory: Introduction, probability theory, Bayesian belief networks, certainty factor theory, dempster-shafer theory

Fuzzy sets and fuzzy logic: Introduction, fuzzy sets, fuzzy set operations, types of membership functions, multi valued logic, fuzzy logic, linguistic variables and hedges, fuzzy propositions, inference rules for fuzzy propositions, fuzzy systems.

TEXT BOOKS:

1. Artificial Intelligence- SarojKaushik, CENGAGE Learning,
2. Artificial intelligence, A modern Approach , 2nd ed, Stuart Russel, Peter Norvig, PEA
3. Artificial Intelligence- Rich, Kevin Knight,Shiv Shankar B Nair, 3rd ed, TMH
4. Introduction to Artificial Intelligence, Patterson, PHI

REFERNCE BOOKS:

1. Artificial intelligence, structures and Strategies for Complex problem solving, -George F Lugar, 5th ed, PEA
2. Introduction to Artificial Intelligence, Ertel, Wolf Gang, Springer
3. Artificial Intelligence, A new Synthesis, Nils J Nilsson, Elsevier

ELECTIVE – II

CLOUD COMPUTING

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/IV**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC4TE6**	

UNIT – I

Introduction to Virtualization and Virtual Machine, Virtualization in Cluster /grid context Virtual network, Information model & data model for virtual machine, Software as a Service (SaaS), SOA, On Demand Computing.

UNIT–II

Cloud Computing: Introduction, Collaborations to Cloud, Cloud application architectures, Value of cloud computing, Cloud Infrastructure models, Scaling a Cloud Infrastructure, Capacity Planning, Cloud Scale.

UNIT – III

Data Center to Cloud: Move into the Cloud, Know Your Software Licenses, The Shift to a Cloud Cost Model, Service Levels for Cloud Applications

UNIT IV

Security: Disaster Recovery, Web Application Design, Machine Image Design, Privacy Design, Database Management, Data Security, Network Security, Host Security, Compromise Response

UNIT–V

Defining Clouds for the Enterprise- Storage-as-a-Service, Database-as-a-Service, Information-as-a-Service, Process-as-a-Service, Application-as-a-Service, Platform-as-a-Service, Integration-as-a-Service, Security-as-a-Service, Management/Governance-as-a-Service, Testing-as-a-Service, Infrastructure-as-a-Service

TEXT BOOKS:

1. Cloud Computing – Web Based Applications That Change the way you Work and Collaborate Online – **Michael Miller**, Pearson Education.
2. Cloud Application Architectures, 1st Edition by **George Reese** O'Reilly Media.

REFERENCE BOOKS:

1. Cloud Computing and SOA Convergence in Your Enterprise: A Step-by-Step Guide **David S. Linthicum** Addison-Wesley Professional.
2. Distributed & Cloud Computing from Parallel Processing to the internet of Things by Kai Hwang. Geoffrey C.Fox.JackJ.Dongarra.
3. Cloud Computing-A Practical Approach, Anthony T. Velte, Toby J. Velte, Robert Elsenpeter. McGrawHill.
4. Cloud Computing PHI Publications, M N Rao.

DATA WAREHOUSING AND MINING LAB

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/IV**	**External Marks**	**: 60**
Credits	**: 2**	**Subject Code: PGMC4L01**	

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1. Demonstration of preprocessing on dataset student.arff
2. Demonstration of preprocessing on dataset labor.arff
3. Demonstration of Association rule process on dataset contactlenses. arff using apriori algorithm
4. Demonstration of Association rule process on dataset test.arff using apriori algorithm
5. Demonstration of classification rule process on dataset student.arff using j48 algorithm
6. Demonstration of classification rule process on dataset employee.arff using j48 algorithm
7. Demonstration of classification rule process on dataset employee.arff using id3 algorithm
8. Demonstration of classification rule process on dataset employee.arff using naïve bayes algorithm
9. Demonstration of clustering rule process on dataset iris.arff using simple k-means
10. Demonstration of clustering rule process on dataset student.arff using simple k-means

ADVANCED JAVA & WEB TECHNOLOGIES LAB

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA II/IV**	**External Marks**	**: 60**
Credits	**: 2**	**Subject Code: PGMC4L02**	

Program I

Design the following static web pages required for an online book store web site.

HOME PAGE:

The static home page must contain three **frames**.

Top frame:

Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

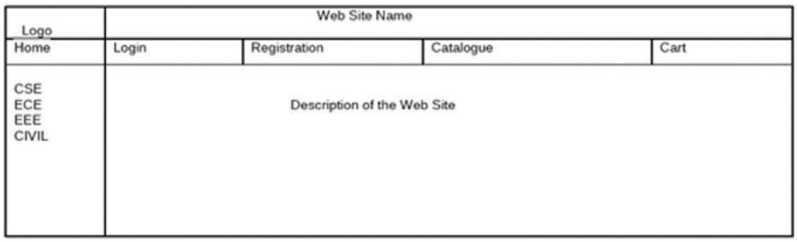
Left frame:

At least four links for navigation, which will display the catalogue of respective links.

For e.g.: When you click the link **"CSE"** the catalogue for **CSE** Booksshould be displayed in the Right frame.

Right frame:

The pages to the links in the left frame must be loaded here. Initially this page contains description of the web site



2) LOGIN PAGE:

This page looks like below:

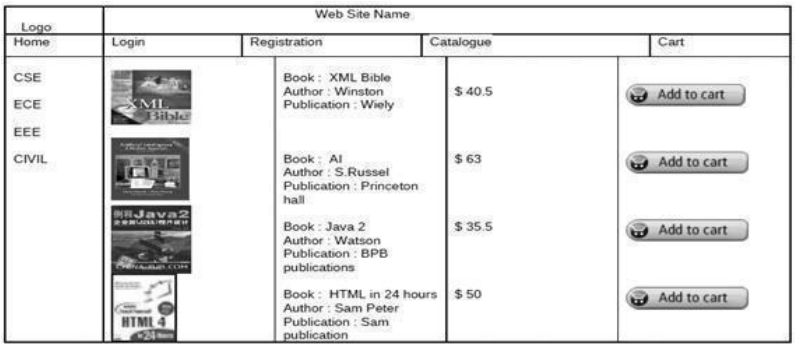
3) CATOLOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in a table

The details should contain the following:

1. Snap shot of Cover Page 2. Author Name. 3. Publisher

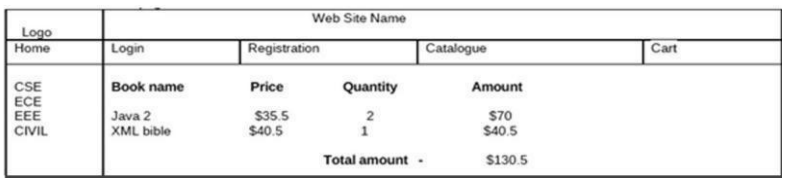
4. Price 5. Add to cart button.



Note: Week 2 contains the remaining pages and their description.

Program II

c) **CART PAGE:** The cart page contains the details about the books which are added to the cart. The cart page should look like this:



iv) **REGISTRATION PAGE:** Create a "*registration form* "with the following fields

1) Name (Text field) 2) Password (password field)

3) E-mail id (text field) 4) Phone number (textfield)

5) Sex (radio button) 6) Date of birth (3 select boxes

c) Languages known (check boxes – English, Telugu,

Hindi, Tamil) 8) Address (text area)

Program III

VALIDATION: Write *JavaScript* to validate the following fields of the above registration page.

c) Name (Name should contains alphabets and the length should not be less than 6 characters).

d) Password (Password should not be less than 6 characters length).

e) E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)

f) Phone number (Phone number should contain 10 digits only). Note : You can also validate the login page with these parameters. Use PHP to connect with the database to store the above details.

Program IV

Design a web page using **CSS (C**ascading **S**tyle **S**heets**)** which includes the following:

Use different font, styles: In the style definition you define how each selector should work (font, color etc.). Then, in the body of your pages, you refer to these selectors to activate the styles.

b) Set a background image for both the page and single elements on the page.

```
BODY {background-image:url(myimage.gif);}
```

You can define the background image for the page like this:

c) Control the repetition of the image with the background-repeat property.

As background-repeat: repeat Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.

c) Define styles for links
as A:link

A:visited
A:active
A:hover

Example:

<style type=”text/css”> A:link {text-decoration: none}

A:visited {text-decoration: none} A:active {text-decoration: none}

A:hover {text-decoration: underline; color: red;} </style>

Work with layers:

5) For example:

LAYER 1 ON TOP:

<div style=”position:relative; font-size:50px; z-index:2;”>LAYER 1 <div style=”position:relative; top:-50; left:5; color:red; font-size:80px; zindex: 1">LAYER 2

LAYER 2 ON TOP:

<div style=”position:relative; font-size:50px; z-index:3;”>LAYER 1 <div style=”position:relative; top:-50; left:5; color:red; font-size:80px; zindex: 4">LAYER 2

c) Add a customized cursor:
Selector{cursor:value}

For example:

```
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
```

Program V

Write an XML file which will display the Book information which includes the following:

1) Title of the book 2) Author Name

3) ISBN number 4) Publisher name

5) Edition 6) Price

Write a Document Type Definition (DTD) to validate the above XML file. Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns. Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically. Hint: You can use some xml editors like XML-spy

Program VI

User Authentication:

Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servlet for doing the following.

Create a Cookie and add these four user id's and passwords to this Cookie.

Read the user id and passwords entered in the Login form and authenticate with the values (user id and passwords) available in the cookies.

If he is a valid user(i.e., user-name and password match) you should welcome him by name(user-name) else you should display " You are not an authenticated user ".

Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

Program VII

Install a database (Mysql or Oracle). Create a table which should contain at least the following fields: name, password, email-id, phone number (these should hold the data from the registration form). Practice 'JDBC' connectivity.

Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries

Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page.

Program VIII

Write a JSP which does the following job:

Insert the details of the 3 or 4 users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user name and password from the database.

Program IX

Create tables in the database which contain the details of items (books in our case like Book name , Price, Quantity, Amount) of each category. Modify your catalogue page in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

INFORMATION SECURITY

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA III/V**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC5T01**	

UNIT - I

Introduction: Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

UNIT –II

Conventional Encryption: Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC

UNIT -III

Public key: Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service

UNIT-IV

IP Security: IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management Web Security: Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET) Email Privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT-V

SNMP: Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3, Intruders, Viruses and related threats Fire walls: Firewall Design principles, Trusted Systems, Intrusion Detection Systems.

TEXT BOOKS:

1. Network Security Essentials: Applications and Standards, William Stallings, PEA.
2. Hack Proofing your Network, Russell, Kaminsky, Forest Puppy, Wiley Dreamtech

REFERENCE BOOKS:

1. Network Security & Cryptography, Bernard Menezes, Cengage,2010
2. Fundamentals of Network Security, Eric Maiwald, Dream Tech
3. Network Security: Private Communication in a Public World, Kaufman, Perlman, PEA/PHI.
4. Principles of Information Security, Whitman, Thomson.
5. Cryptography and Network Security, 3/e, Stallings, PHI/PEA
6. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
7. Introduction to Cryptography, Buchmann, Springer

OBJECT ORIENTED ANALYSIS AND DESIGN USING UML

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA III/V**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC5T02**	

UNIT-I

Introduction to UML: The meaning of Object-Orientation, object identity, encapsulation, information hiding, polymorphism, genericity, importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture.

UNIT- II

Basic Structural Modeling: Classes, relationships, common mechanisms, diagrams, Advanced structural modeling: advanced relationships, interfaces, types & roles, packages, instances.

Class & Object diagrams: Terms, concepts, examples, modeling techniques, class & Object diagrams.

UNIT- III

Collaboration diagrams: Terms, Concepts, depicting a message, polymorphism in collaboration diagrams, iterated messages, use of self in messages.

Sequence diagrams: Terms, concepts, differences between collaboration and sequence diagrams, depicting synchronous messages with/without priority call back mechanism broadcast message.

UNIT- IV

Behavioral Modeling: Interactions, use cases, use case diagrams, activity diagrams. Advanced Behavioral Modeling: Events and signals, state machines, processes & threads, time and space, state chart diagrams.

UNIT –V

Architectural Modeling: Terms, concepts, examples, modeling techniques for component diagrams and deployment diagrams.

TEXT BOOKS:

1. The Unified Modeling Language User Guide, Grady Booch, Rambaugh, Ivar Jacobson,
    a. PEA

2. Fundamentals of Object Oriented Design in UML, Meilir Page-Jones, Addison Wesley

REFERENCE BOOKS:

1. Head First Object Oriented Analysis & Design, Mclaughlin,SPD OReilly,2006
2. Object oriented Analysis& Design Using UML, Mahesh ,PHI
3. The Unified Modeling Language Reference Manual, 2/e, Rambaugh, Grady Booch,etc., PEA
4. Object Oriented Analysis & Design, Satzinger, Jackson, Thomson
5. Object Oriented Analysis Design & implementation, Dathan.,Ramnath, University Press
6. Object Oriented Analysis & Design, John Deacon, PEA
7. Fundamentals of Object Oriented Analysis and Design in UML, M Pages-Jones, PEA
8. Object-Oriented Design with UML, Barclay,Savage,Elsevier,2008

MULTIMEDIA APPLICATION DEVELOPMENT

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA III/V**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC5T03**	

UNIT - I

Fundamental concepts in Text and Image: Multimedia and hypermedia, World Wide Web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

UNIT - II

Fundamental Concepts in Video and Digital Audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

UNIT-III

Action Script I: Action Script Features, Object-Oriented Action Script, Data types and Type Checking, Classes, Authoring an Action Script Class. Action Script II: Inheritance, Authoring an Action Script 2.0 Subclass, Interfaces, Packages, Exceptions.

Application Development: An OOP Application Frame work, Using Components with Action Script Movie Clip Subclasses.

UNIT - IV

Multimedia Data Compression: Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding

UNIT- V

Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.

Multimedia Networks: Basics of Multimedia Networks, Multimedia Network Communications

And Applications: Quality of Multimedia Data Transmission, Multimedia over IP.

TEXT BOOKS:

1. Fundamentals of Multimedia ,Ze-Nian Li , Mark S. Drew, PHI/ PEA.
2. Essentials Action Script 3.0, Colin Moock, SPD O, Reilly,2007.

REFERENCE BOOKS:

1. Multimedia Applications, Steinmetz, Nahrstedt, Springer.
2. Digital Multimedia, Nigel Chapman, Jenny Chapman, Wiley-Dreamtech.
3. Multimedia & Communications Technology, Steve Heath, Elsevier .
4. Multimedia Technology & Applications, David Hilman ,Galgotia.
5. Multimedia Technologies, Banerji, Mohan Ghosh, MGH.
6. Multimedia Systems, ParagHavaldar, Gerard Medioni, cengage, 2009.

ELECTIVE – III

E-COMMERCE

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA III/V**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC5TE1**	

UNIT-I

Electronic Commerce, Frame Work, Anatomy of E-Commerce Applications, E-Commerce Consumer Applications, E-Commerce organization applications. Consumer Oriented Electronic Commerce, Mercantile Process Models.

UNIT- II

Electronic Payment Systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Designing Electronic Payment Systems.

UNIT-III

Inter Organizational Commerce - EDI, EDI Implementation, Value added networks. Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT- IV

Corporate Digital Library -Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing, Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT- V

Consumer Search and Resource Discovery, Information Search and Retrieval, Commerce Catalogues, Information Filtering. Multimedia -key multimedia concepts, Digital Video and electronic Commerce, Desktop Video Processing, Desktop video conferencing.

TEXT BOOK :

1. Frontiers of Electronic Commerce ,Kalakata, Whinston, PEA,2006.

REFERENCE BOOKS:

1. E-Commerce Fundamentals and Applications Hendry Chan, Raymond Lee,Dillon,Chang, John Wiley.
2. E-Commerce, A Managerial Perspective, Turban E, Lee J , King, Chung H.M.,PEA,2001.
3. E-Commerce An Indian Perspective , 3/e, P.T. Joseph, PHI,2009.
4. E-Commerce, S.Jaiswal, Galgotia.
5. Electronic Commerce, Gary P.Schneider, Thomson.

ELECTIVE – III

ANIMATION & GAMING

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA III/V**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC5TE2**	

UNIT-I

What is mean by Animation – Uses of Animation – History of Animation – Uses of Animation – Types of Animation – Principles of Animation – Some Techniques of Animation – Animation on the WEB – 3D Animation – Special Effects - Creating Animation.

UNIT-II

Creating Animation in Flash: Introduction to Flash Animation – Introduction to Flash – Working with the Timeline and Frame-based Animation -Working with the Timeline and Tween-based Animation – Understanding Layers

UNIT-III

Concept Development – Story Developing – Audio & Video – Color Model – Device Independent Color Model – Gamma and Gamma Correction Production Budgets - 3D Animated Movies.

UNIT –IV

Animation: The Animation Loop, Calculating Frame Rates, Scheduling Tasks at Alternate Frame Rates, Restoring the Background, Double Buffering, Time – Based Motion, Scrolling the Background, Parallax, User Gestures, Timed Animations, Animation Best Practices

UNIT –V

A Game Engine , The Game Loop, Loading Images, Multitask Sound, Keyboard Events, High Scores, The Game Engine Listing, The Ungame, A Pinball Game

TEXT BOOKS:

1. PRINCIPLES OF MULTIMEDIA – Ranjan Parekh, 2007, TMH. (Unit I, Unit III)
2. Multimedia Technologies – Ashok Banerji, Ananda Mohan Ghosh – McGraw Hill Publication. (Unit II: Chapter 10)
3. Core HTML5 CANVAS, Graphics, Animation and Game Development, David Geary, PEARSON (Unit IV, Unit V)

ELECTIVE – III

COMPUTER FORENSICS

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA III/V**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC5TE3**	

UNIT-I:

Computer Forensics and Investigations: Understanding Computer Forensics, Preparing for Computer Investigations, Taking a Systematic Approach, Procedure for Corporate High-Tech Investigations, Understanding Data Recovery Workstations and Software. **Investor's Office and Laboratory**: Understanding Forensics Lab Certification Requirements, Determining the Physical Requirements for a Computer Forensics Lab, Selecting a Basic Forensic Workstation

UNIT-II

Data Acquisition: Understanding Storage Formats for Digital Evidence, Determining the Best Acquisition Method, Contingency Planning for Image Acquisitions, Using Acquisition Tools, Validating Data Acquisition, Performing RAID Data Acquisition, Using Remote Network Acquisition Tools, Using Other Forensics Acquisition Tools Processing Crime and **Incident Scenes**: Identifying Digital Evidence, Collecting the Evidence in Private-Sector Incident Scenes, Processing law Enforcement Crime Scenes, Preparing for a Search, Securing a Computer Incident or Crime Scene, Sizing Digital evidence at the Scene, Storing Digital evidence, obtaining a Digital Hash.

UNIT-III

Current Computer Forensics Tools: Evaluating Computer Forensics Toll Needs, Computer Forensics Software Tools, Computer Forensics Hardware Tools, Validating and Testing Forensics Software Computer Forensics Analysis and Validation: Determining What Data to Collect and Analyze, Validating Forensic Data, Addressing Data-Hiding Techniques, Performing Remote Acquisition

UNIT-IV

Recovering Graphics and Network Forensics: Recognizing a Graphics File, Understanding Data Compression, Locating and Recovering Graphics Files, Understanding Copyright Issues with Graphics, Network Forensic, Developing Standard Procedure for Network Forensics, Using Network Tools, Examining Hiney Project

UNIT-V

E-mail Investigations Cell Phone and Mobile Device Forensics: Exploring the Role of E-mail in Investigations, Exploring the Role of Client and Server in E-mail, Investigating E-mail Crimes and Violations, Understanding E-mail Servers, Using Specialized E-mail Forensics Tools, Understanding Mobile Device Forensics, Understanding Acquisition Procedure for Cell Phones and Mobile Devices

TEXT BOOK:

J. Nelson, Phillips Enfinger, Steuart, " Computer Forensics and Investigations, Cengage Learning.

ELECTIVE –IV

MIDDLEWARE TECHNOLOGIES

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA III/V**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC5TE4**	

UNIT-I

Introduction to Object Oriented Systems: Preview of Object-orientation, Concept of distributed object systems, Reasons to distribute for centralized Objects. Client-server system architecture, Multi tier system architectures. File Server, Database Server, Group Server, Object Server, Web Server.

UNIT-II

Introduction to Middleware Technologies: General Middleware, Service Specific Middleware, Client/Server Building blocks, RPC - messaging, Peer-to-Peer, Java RMI. Introduction to Distributed Objects: Computing standards, OMG, Overview of CORBA, Overview of COM/DCOM, and Overview of EJB.

UNIT-III

EJB Architecture: Overview of EJB software architecture, View of EJB Conversation, Building and Deploying EJBs, Roles in EJB.

UNIT-IV

CORBA: Introduction and concepts, distributed objects in CORBA, CORBA components, architectural features, method invocations, static and dynamic: IDL (Interface Definition

Language) models and interfaces. Structure of CORBA IDL, CORBA's self-describing data; CORBA interface repository. Building an application using CORBA.

UNIT-V

COM and NET: Evolution of DCOM, Introduction to COM, COM clients and servers, COM IDL, COM Interfaces, COM Threading Models, Marshalling, Custom and standard marshalling, Comparison COM and CORBA. Service Oriented architecture (SOA) Fundamentals: Defining SOA, Business value of SOA, SOA characteristics, Concept of a service, Basic SOA, SOA enterprise Software Models.

TEXT BOOKS:

1. Distributed Component Architecture, G. Sudha Sadasivam , Wiley
2. Service Oriented Architecture: Concepts , Technology & Design, Thomas Erl, PHI
3. Java Programming with CORBA, 3/e,G. Brose, AVogel, K. Duddy, Wiley-dreamtech
4. Distributed Systems, 2/e, Tanenbaum, Van Steen, PEA

REFERENCE BOOKS :

1. Client/server Programming with Java &Corba W/cd, Robert Orfali, Dan Harkey, Wiley
2. Component Software: Beyond Object-Oriented Programming, Clemens Szyperski, PEA.
3. Inside CORBA, Mowbray, PEA
4. COM and CORBA side by side, Jason Pritchad, PEA
5. Enterprise JavaBeans 3.0, 5/e, Bill Burke, O'Reilly .
6. Component based technology, SudhaSadasivam, Wiley

ELECTIVE – IV

SOFTWARE PROJECT MANAGEMENT

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA III/V**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC5TE5**	

UNIT- I

Conventional Software Management: The waterfall model, conventional software Management performance. Evolution of Software Economics: Software Economics, pragmatic software cost estimation. Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections. The old way and the new: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT- II

Life Cycle Phases: Engineering and production stages, inception, Elaboration, construction, transition phases. Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

UNIT - III

Model based software architectures: A Management perspective and technical perspective. Work Flows of the process: Software process workflows, Iteration workflows. Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT - IV

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations. Process Automation: Automation Building blocks, The Project Environment. Project Control and Process instrumentation: The seven core Metrics

Management Indicators, Quality Indicators, Life Cycle Expectations, Pragmatic Software Metrics, Metrics Automation.

UNIT -V

Tailoring the Process: Process discriminates. Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions.

TEXT BOOKS:

1. Software Project Management, Walker Royce, PEA, 2005.

REFERENCE BOOKS:

1. Software Project Management, Bob Hughes,3/e, Mike Cotterell, TMH
2. Software Project Management, Joel Henry, PEA
3. Software Project Management in practice, PankajJalote, PEA, 2005,
4. Effective Software Project Management, Robert K.Wysocki, Wiley,2006
5. Project Management in IT, Kathy Schwalbe, Cengage
6. Quality Software Project Management, Futrell,Donald F. Shafer, Donald I. Shafer, PEA

ELECTIVE – IV

Big Data Analytics

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA III/V**	**External Marks**	**: 60**
Credits	**: 3**	**Subject Code: PGMC5TE6**	

UNIT-I

Introduction: Velocity, Variety, Veracity, Drivers for Big Data, Sophisticated Consumers, Automation, Monetization, Big Data Analytics Applications: Social Media Command Center, Product Knowledge Hub, Infrastructure and Operations Studies, Product Selection, Design and Engineering, Location-Based Services, Online Advertising, Risk Management

UNIT-II

Architecture Components: Massively Parallel Processing (MPP) Platforms, Unstructured Data Analytics and Reporting: Search and Count, Context-Sensitive and Domain-Specific Searches, Categories and Ontology, Qualitative Comparisons, Data Privacy Protection, Real-Time Adaptive Analytics and Decision Engines

UNIT-III

Advanced Analytics Platform: Real-Time Architecture for Conversations, Orchestration and Synthesis Using Analytics Engines, Entity Resolution, Model Management. Discovery Using Data at Rest, Integration Strategies.

Implementation of Big Data Analytics: Revolutionary, Evolutionary, or Hybrid, Big Data Governance, Integrating Big Data with MDM, Evolving Maturity Levels

UNIT - IV

Map-Reduce and the New Software Stack: Distributed File Systems. Physical Organization of Compute Nodes, Large-Scale File-System Organization. Map-Reduce features: Map Tasks, Grouping by Key, Reduce Tasks, Combiners, Map-Reduce Execution, Coping With Node Failures, Algorithms Using Map-Reduce for Matrix multiplication, Relational Algebra operations, Workflow Systems, Recursive Extensions to Map-Reduce

UNIT – V

Communication Cost Models, Complexity Theory for Map-Reduce, Reducer Size and Replication Rate, Graph Model and Mapping Schemas, Lower Bounds on Replication Rate.

Text Books:

1. Big Data Analytics: Disruptive Technologies for Changing the Game, *Dr. Arvind Sathi,,*First Edition October 2012, IBM Corporation

2. Mining of Massive Datasets, Anand Rajarama, Jure Leskovec, Jeffrey D. Ullman.E-book, 2013

Reference Books:

1. Big Data Imperatives, Soumendra Mohanty, Madhu Jagadeesh, Harsha Srivatsa, Apress, e-book of 2012

OBJECT ORIENTED ANALYSIS & DESIGN USING UML LAB

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA III/V**	**External Marks**	**: 60**
Credits	**: 2**	**Subject Code: PGMC5L01**	

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1. To create a UML diagrams of ATM APPLICATION.
2. To create a UML diagrams of LIBRARY MANAGEMENT SYSTEM.
3. To create a UML diagrams of ONLINE BOOK SHOP
4. To create a UML diagrams of RAILWAY RESERVATION SYSTEM
5. To create a UML diagrams for BANKING SYSTEM

MULTIMEDIA APPLICATION DEVELOPMENT LAB

Lecture	**: 4 Periods/Week**	**Internal Marks**	**: 40**
Year/Semester	**: MCA III/V**	**External Marks**	**: 60**
Credits	**: 2**	**Subject Code: PGMC5L02**	

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1. Assigning Actions to an Object, and a Button
2. Creating Loops
3. Generation Random Numbers
4. Creating a Function, Calling a Function
5. Detecting the Player Version
6. Detecting the Operating System
7. Checking the System language
8. Detecting Display Settings
9. Tinting a Movie Clip's Color
10. Controlling a Movie Clip's Color with Sliders
11. Drawing a Circle
12. Drawing a Rectangle
13. Filling a Shape with a Gradient
14. Scripting Masks
15. Converting Angle Measurements
16. Calculating the Distance between the Two Points
17. Formatting Currency Amount
18. Converting Between Units of Measurement
19. Determining Points along a Circle
20. Sorting or Reversing an Array
21. Implementing a Custom Sort
22. Creating a Text Field
23. Making a Password Input field

All the above programs are to be done in Flash MX 2004.

Reference:

1. Action Script Cookbook, Joey Lott, SPD-Oreilly.
2. Flash MX Action Script for designers, Doug Sahlin, Dreamtech Wiley.
3. Flash MX Professional 2004 Unleashed, David Vogeleer and Matthew Pizzi , Pearson Education.

SOFT SKILLS/APTITUDE LAB

Year/Semester : MCA III/V **Internal Marks: 50**

Credits : 2 **Subject Code: PGBS5L01**

Objectives:

- To encourage the all-round development of students by focusing on soft skills
- To make students aware about the importance, the role and the content of soft skills through instruction, knowledge acquisition and practice

1	Interpersonal skills and Relationships	1
2	Presentation Skills	1
3	Planning & Stress Management	1
4	Leadership & Facilitation	1
5	Conflict Management and Decision Making	1
6	The art of Negotiation	1
7	Language skills LSRW	2
8	Communication Skills	4
9	Learning Skills : Critical Thinking- Creative Thinking – Communicating- Collaborating	3
	Total	15

References for students for their self-study:

1. You can win by Shiv Khera :Macmillan books
2. The 7 habits of Highly effective people – Stephen Covey
3. Sure Success in Interviews
4. Web resources