



CBCS CURRICULUM OF

P.G. MASTER IN COMPUTER APPLICATION PROGRAMME

SUBJECT CODE = MCA

FOR POST GRADUATE COURSES UNDER NILAMBER PITAMBER UNIVERSITY



Implemented w.e.f. Academic Session 2020-2022



ESTD: 27-October-2016 Ph. No.: +91-8840652363 (Self-financing course of N.P. University)

MCA COURSE, N.P. UNIVERSITY

G.L.A. COLLEGE CAMPUS - 822102

12/2021

Ref :

21/12/2021 Date : .

On-line Meeting of Board of Study MCA Course, NPU Medininagar, Jharkhand

On-line meeting of Board of study held on 21/12/2021 in the Department of MCA Course, NPU, Medininagar, Palamu, Jharkhand at 3:00 PM to 4:30 PM Under Chairmanship of Dr. Gajendra Singh, Director of MCA Course, NPU. The following members have been attended in the meeting:

1. Dr. Gajendra Singh (Chairman)

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- 2. Dr. Udayan Barua (External Expert)
- 3. Dr. J.N. Singh (External Expert)
- 4. Dr. Ravi Shankar (Member)
- 5. Mr. Abhishek Kumar (Member)
- 6. Miss Puja Kumari (Member)
- 7. Mr. Gunjan Kumar Singh (Member)
- 8. Miss Kajal Kumari (Member)

At present, the syllabus for MCA Course, NPU for 2 – years (4 Semester) under choice based credit system, has been accepted after the discussion of the members of the board of study.

21.1.2022 Director, MCA Course Nilamber-Pitamber University G.L.A. College Campus Medininagar Director MCA Course

Nilamber Pitamber University

Nilamber-Pitamber University, Medininagar



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MCA COURSE, N.P. UNIVERSITY

G.L.A. COLLEGE CAMPUS - 822102

Ref :

18/01/2022 Date : ...

On-line Meeting of Board of Study MCA Course, NPU Medininagar, Jharkhand

2nd On-line meeting of Board of study held on 18/01/2022 in the Department of MCA Course, NPU, Medininagar, Palamu, Jharkhand at 3:00 PM to 4:30 PM Under Chairmanship of Dr. Gajendra Singh, Director of MCA Course, NPU. The following members have been attended in the meeting:

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Director, MCA Course Nilamber-Pitamber University G.L.A. College Campus Medininagar

MCA Course Nilamber Pitamber University

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Director, MCA Course Nilamber-Pitamber University G.L.A. College Campus Medininagar Director MCA Course

Nilamber Pitamber University

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CBCS Curriculum Nilam REGULATIONS

MASTER OF COMPUTER APPLICATIONS (2 Years)

1. Overview of MCA

- a) The regulations herein specified are applied to Master of Computer Applications (MCA) course offered by the Nilamber-Pitamber University, Medininagar.
- b) Master of Computer Application (MCA) Course has been restructured to be a two-year postgraduate course instead of the existing three-year postgraduate degree course. The change in the duration of the MCA course will not impact the existing curriculumand course structure severely.
- c) Master of Computer Applications is a two year professional course offered for graduates wanting to learn modern programming language. A blend of theory and practical knowledge helps students to develop better and faster applications and designed to meet qualified professional for industry.

2. Time scale for academic activity

- a) The basic units of time for academic activity for the MCA Course shall be a semester (July to December and January to June).
- b) The department may schedule a summer programme during vacation of the department. There will be in general no formal classes in the summer programme.

3. Duration of Curriculum and Calendar

- a) Master of Computer Applications (MCA) programme is of Two years duration. Each year shall be divided into two semesters. First semester shall normally beginin July and ends in December. Second semester shall normally begin in January and ends in June.
- b) Each year, the university shall draw an academic calendar and the same shall be negotiable and strictly adhered to the academic calendar for the first year shall be handed over to each admitted student along with his/her university registration card. Second year academic calendar shall be made available duringregistration for third semester.
- c) The curriculum and syllabus shall be modified with approval of the academic council once in every two years to keep the same up-to-date. However, minor modifications can be done as and when necessary with the approval of Vice- Chancellor. The modification so done shall be placed to the immediate next academic council meeting for rectification.
- d). A candidate may be permitted to complete MCA degree requirements in not morethan 4

Faculty MCA Course, NPU Medininagar

4. Eligibility Criteria for Admission

- a) The candidate must hold a bachelor's degree (with mathematics at 10+2 level) or BCA/B.Sc.(Computer Application)/B.Sc.(Information Technology) of a recognized University incorporated by an act of the central or state legislatures in India or other educational institutions established by an act of parliament registered under section (2f)/12(B) of UGC act 1956 or declared to be deemed of an university under section 3 of UGC act, 1956 or passed an equivalent qualification recognized by the ministry of HRD, Government of India.
- b) The candidate must have secured at least 50% of marks (45% marks in case of candidates belonging to reserved category) in aggregate at the graduation level.
- c) Candidates appearing for the final examination of their bachelor's programme can also apply and if selected can join the programme provisionally. At the timeof counseling they must bring the certificates in original.
- d) At the time of the counseling candidates will be required to show their original certificates and mark sheets of 10+2 and graduation level, MCA test admit card, caste certificate and any special category certificate, if any.

5. Scheme of Instruction

The scheme of instruction in Post-Graduate Programme shall be of the following forms of academic activity:

- a) Theory
- b) Sessional
- c) Practical Training and Project Work
- d) Seminar and Tutorial

a) Theory

A theory type of academic activity shall involve concepts, fundamental ideas and techniques, as laid down in text books or literature and which can be grasped through lectures and assignments. A theory type of course with about 45 contactperiods in a semester shall enable participating student to earn one unit of academic credit provided that he/ she fulfils the attendance, and grade requirements as specified here in after.

b. Sessional

The following type of academic work will be covered in sessional:

- i) Laboratory Experiment
- ii) Design Exercise
- iii) Project
- iv) Term paper or any other academic work, the purpose of which would beto trained the student by practice, repeated use and hands on experience.

c. Practical Training and Project Work

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CBCS Curriculum After second semester during summer break either student should undergoPractical Training or do Mini Project. During the fourth semester of study, a student will be examined in the course "Project work".

- Mini Project work may be done individually or in groups. However if projectis done 1. in groups, each student must be given a responsibility for a distinct module and care should be taken to see the progress of individual modulesis independent of others.
- 2. Major Project work must be done individually.
- 3. Students should take guidance from an internal guide and prepare a ProjectReport on "Project Work" in 2 copies to be submitted to the Director of the Institute/Department by April. A separate file containing source-codelistings should also be submitted. Before start of the project, every studentshould submit project synopsis in predefined format.
- The Project Synopsis should contain an Introduction to Project, which should 4. clearly explain the project scope in detail. Also, Data Dictionary, DFDs, ERDs, File designs and a list of output reports should be included.
- 5. The Project Work should be of such a nature that it could prove useful or be relevant from the commercial/management angle.
- The Project report will be duly assessed by the internal guide and marks will be 6. communicated by the Director to the University along with the marks of the internal credit for theory and practical.
- The project report should be prepared in a format prescribed by the University, 7. which also specifies the contents and methods of presentation.
- 8. The major project work carries 200 marks. Distribution of Marks: Documentation-50, Design-50, Coding-50, Presentation-25, Viva-25. The Project Evaluation shall be conducted by two external examiners.
- Project work can be carried out in the Institute/Department or outside withprior 9. permission of the Institute/Department.
- 10. Project viva-voce by the University panel will be conducted in the month of May.

6) **Attendance Requirement**

All students must attend every lecture, practical classes and other activities of the Department. However, the attendance requirement will be a minimum of 75% of the classes actually held.

Absence during the semester

- a. A student must inform the Director concerned immediately of any instance of continuous absence from classes.
- b. A student who is absent due to illness should approach the teachers concerned for makeup quizzes, assignment and laboratory work.
- c. A student who remains absents from a Sessional test due to illness approach theteacher concerned for makeup test immediately on return to class. The request should be supported with a medical certificate issued by a registered medical practitioner.

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d. If a student is continuously absent from the Institute/Department for more thanfour weeks without permission of the head of the department concerned, his/hername will be removed from Institute/Department rolls.

7) Examination Assessment

Theory Paper -----70 marks + 30 marks

70 marks ------ External evaluation (End Semester Exam)

30 marks ------ Internal evaluation (Mid Sem exam & Attendance)

1. Mid Semester Examination (MSE):

• Written Examination - 20 marks of a paper

There will be **two** groups of questions in written examinations of 20 marks.**Group A is compulsory** and will contain five questions of **very short answer type** consisting of one mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any threeare to be answered.

- Attendance 5 marks
- Assignment 5 marks

2. End Semester Examination (ESE):

There will be **two** groups of questions. **Group A is compulsory** and will contain two questions. Question No.1 will be very short answer type consisting of five questions of one mark each. Question No.2 will be short answer type five questions of five marks each, out of which any three are to be answered. **Group B will contain descriptive type** seven questions of ten marks each, out of which any four are to be answered.

3. Sessional Examination ----- 50 Marks

There should be one External and one internal examiner for each sessional Examination.

4. Question Paper Pattern:

The question paper shall consist of two sections: **Group A is compulsory** and willcontain two questions. Question No.1 will be very short answer type consisting offive questions of one mark each. Question No.2 will be short answer type five questions of five marks each, out of which any three are to be answered. **Group B will contain descriptive type** seven questions of ten marks each, out of whichany four are to be answered.

8) Student Discipline

Every student is required to observe a polite and disciplined behavior both inside andoutside the campus and should not indulge in any activity which would tend to bring down the prestige of the Institute/Department or disturb the peaceful and congenial environment of the campus.

An act of indiscipline on the part of the student may result into adequate discredit anda mention in his/her academic grade card and/or transcript.

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MCA Course CBCS Curriculum Nilamber-Pitamber University, Medininagar **Note:** The department in consultation with the university shall have the right to change/modify any regulation or part thereof in the academic interest of the students.

9. Eligibility for Appearing in Semester Examination

- 1. A student shall be eligible in an examination provided he/she pursues a regular course of study and attends at least 75% of class in each theory and sessional subject during the semester. The attendance shall be considered from the date of admission of the candidate in the institution. Attendance record will be compiled at the time of each test and the students with poor attendance will informed through notification. The guardian will also be informed through a letterbefore he/she is debarred for appearing university examination due to shortage of attendance.
- 2. Concessions: A student who has been absent for short periods on medical groundor due to participation in cultural, sports, other academic/official assignments inthe interest of the Department/University with prior written permission of the head of the institution shall be permitted a maximum of additional concession of10% in attendance and shall be eligible for appearing in examination with a minimum 65% of attendance in semester.
- 3. A student shall be admitted to any examination in a subject only if he/she has been registered for that subject.
- 4. A candidate shall be allowed in an examination only if he/she is issued an admit card for the relevant examination by the University/Department.

10. Promotion

Promotion to the 2^{nd} year shall be permitted only with a maximum of four Backlog Papers from the preceding year (1^{st} year). Further no entry to the next Semester.

Provision of Special examination:

Students keeping one or two backlogs in 3rd or 4th Semester can be given one special opportunity after declaration of 4th Semester result to clear their backlog papers so that they may go to Job.

Moderation of result:

Notwithstanding anything contained elsewhere in the Regulations, the University shall have power to moderate the MCA results on the recommendations of the Examination Board and/or the academic council.

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11. Final Result

Cumulative Grade Point Average

The Cumulative Grade Point Average (CGPA) will be calculated on the 10 point grading scaleas follows:

Grade Point	Parentage of Marks	Grade Symbol	Grade Meaning
10	91-100	0	Outstanding
09	81-90	A+	Excellent
08	71-80	A	Very Good
07	61-70	B+	Good
06	51-60	В	Above Average
05	41-50	C	Average
04	40	Р	Pass
00	Below 40	F	Fail or Absent

CBCS Curriculum **DEPARTMENT OF MCA COURSE**

NILAMBER-PITAMBER UNIVERSITY, **MEDININAGAR COURSE STRUCTURE** CHOICE BASED CREDIT SYSTEM (CBCS)

The proposed CBCS system has the potential of providing a choice of a wide spectrum of subjects/branches of subjects to students in pursuit of achieving their esteemed goals. This system has been globally accepted and now has become the need of the day. The UGC alsohas provided guidelines to the Universities for consideration and implementation of CBCS.

The Department of MCA Course, NPU proposes the following courses and credits to be initiated at MCA w.e.f. the session 2020-22. The proposed system may be modified/improved in future according to the requirements.

COURSES OF STUDY FOR 2 YEARS M.C.A.CORE PAPERS

	FC, Core, Lang. Elect., Proff. Elect., Ability Enhancement Courses			Examination Structure			
Sem	Paper	Paper code	Papers	Credit	Mid Semester Theory (F.M.)	End Semester Theory (F.M.)	End Semester Practical/ Viva (F.M.)
	Core Course	FCMCA101	Effective Organizational Communication	3	30	70	
	Core Course	CCMCA102	Operating System	3	30	70	
	Core Course	CCMCA103	Data Structure Through C++	3	30	70	
I	Core Course	CCMCA104	Database Management System	3	30	70	
	Core Course	CCMCA105	Computer System Architecture	3	30	70	
	Practical's on Core	CPMCA106	Lab on Unix/Linux command & Shell Prog.	2	30		70
	Practical's on Core	CPMCA107	Lab on DS through C++ programming	2	30		70
	Practical's on Core	CPMCA108	Lab on SQL/PL-SQL	2	30		70

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Course CBCS Curriculum Nilambe			r-Pitamber University, Medininagar				
	Elective Course	ECMCA201	Language Elective-I Java Programming Digital Image Processing	3	30	70	
	Core Course	CCMCA202	Discrete Mathematics with Graph Theory	3	30	70	
	Core Course	CCMCA203	Software Engineering	3	30	70	
	Core Course	CCMCA204	Automata Theory	3	30	70	
	Core Course	CCMCA205	Data Communication & Computer Networks	3	30	70	
II	Core Course	CCMCA206	Python Programming	3	30	70	
	Practical's on Elective	EPMCA207	Language Elective-I Lab on Java Programming Lab	2	30		70
	Practical's on Core	CPMCA208	Lab on HTML, CSS, Case Tools	2	30		70
	Practical's on Core	CPMCA209	Lab on Networking	2	30		70
	Practical's on Core	CPMCA210	Lab on Python Programming	2	30		70
	Elective Course	ECMCA301	Language Elective-II Advanced Java Programming Management Information System	3	30	70	
	Core Course	CCMCA302	Compiler Design	3	30	70	
	Core Course	CCMCA303	PHP, Java Script & JQuery Programming	3	30	70	
	Core Course	CCMCA304	Analysis & Design of Algorithm	3	30	70	
	Core Course	CCMCA305	Network Security and Cryptography	3	30	70	
	Core Course	CCMCA306	Computer Graphics	3	30	70	
111 -	Core Course	CCMCA307	Optimization Technique	3	30	70	
-	PROF EL-I	PRMCA308	Professional Elective-I Data Warehousing and Data Mining Artificial intelligence	3	30	70	
	Practical's on Elective	EPMCA309	Language Elective-II Lab on Advanced Java Programming Lab	2	30		70
	Practical's on Core	CPMCA310	Lab on PHP, Java Script & JQueryProgramming	2	30		70
	Practical's on Core	CPMCA311	Lab on Computer Graphics	2	30		70
	Ability Enhance ment Course	PRMCA401	Pre Submission Seminar	2			50
IV	Ability Enhancement Course	PRMCA402	Major Project (SRS, Design, Implementation& Testing)	6			200
			Total	85	870	1330	950

Total Marks: 3150

DETAILED SYLLABUS

Faculty MCA Course, NPU Medininagar

SEMESTER I

8 Papers

Total 100 X 8 =800 Marks

I. <u>COMPULSORY FOUNDATION COURSE (FC)[FCMCA101]</u>:

(Credits: Theory-03)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for <u>Mid</u> <u>Semester Examination (MSE):</u>

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be very short answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1mark; >75 to <=80, 2 marks; >80Attd.<=85,3 marks; >85Attd.<=90,4marks; >90Attd, 5 marks.

EFFECTIVE ORGANIZATIONAL COMMUNICATION

Theory: 45 Lectures

Unit - I Basics of communication: Definition, Objectives, Process and Elements, Flow of communication, Types of Communication, Principles of Effective communications, Barriers to Communication.

Unit - II Verbal & Non-verbal communication: Methods of verbal & non- Verbal communication and their difference.

Unit - III Listening Skills: Definition & importance of listening, Principles, Process, Types of listening, Barriers to effective listening.

Unit - IV Essay writing

Unit - V Presentation Principles, Slide Preparation, Report writing.

Unit - VI Business/ Official correspondence.

Unit - VII Preparation of Curriculum Vitae, Job Application and Interview Techniques.

Reference Books:

Meenakshi Raman & Prakash Singh"Business communication".

R. and Panton F "The essence of effective communication"

Munter. M "Business communication: Strategy and skill".

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Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

OPERATING SYSTEM

Theory: 45 Lectures

Unit – I: Operating Systems Introduction: OS and the Computer System, Efficiency, System Performance and User Convenience, Classes of Operating Systems, Batch Processing Systems, Multiprogramming Systems, Time Sharing Systems, Real Time Operating Systems, Distributed OperatingSystems, Modern Operating Systems.

Unit – II: Processes and Threads: Processes and Programs, Programmer view of Processes, OS view of Processes, Threads, Case studies of Processes and Threads.

Unit – III: Scheduling Concepts: Preliminaries, Non-preemptive Scheduling Policies and algo, Preemptive Scheduling Policies, Scheduling in Practice, Real Time Scheduling, Scheduling in Unix, Scheduling in Linux, Scheduling in Windows, Performance Analysis of Scheduling Policies.

Unit –**IV Memory Management :** Managing the Memory Hierarchy, Static and Dynamic Memory Allocation, Memory Allocation to a Process, Reuse of Memory, Contiguous Memory Allocation, Noncontiguous Memory Allocation, Paging, Segmentation, Segmentation with Paging, Kernel Memory Allocation, A Review of Relocation, Linking and Program Forms.

Unit -V Virtual Memory: Virtual Memory Basics, Demand Paging, Page Replacement algorithms, Memory Allocation to a Process, Shared Pages, Memory Mapped Files, Unix Virtual Memory, Virtual Memory using Segmentation.

Unit -VI File Systems: File System and IOCS, Files and File Operations, Fundamental File Organizations, Directory Structures, File Protection, Interface between File System and IOCS, Allocation of Disk Space and disk hardware, scheduling algo. Implementing File Access, Unix File System, Linux File System, Windows File System.

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Unit VII Deadlocks: Definition of Deadlocks, Deadlocks In Resources Allocation, Handling Deadlocks, Deadlocks Prevention and Avoidance.

Unit -VIII Security and Protection: Overview of Security and Protection, Goals of Security and Protection, Security Attacks, Formal and Practical aspects of Security, Encryption, Authentication and Password Security, Access Descriptors and the Access Control Matrix, Protection Structures, Capabilities, Unix Security, Linux Security, Windows Security.

Reference Books:

D.M. Dhamdhere- Operating Systems: A Concept-Based Approach, TMH,

A. Silberschatz et.al-Operating System Concepts, 6thEdn, John Wiley, Indian Reprint, 2003

C. Cronsley-Operating Systems: A Design-Oriented Approach, TMH, New

Delhi,2002

H.M. Deitel-Operating Systems, 2ndEdn, Pearson Education, 2003.

A.S. Tanenbaum-Operating System: Design and Implementation, PHI, New Delhi,2002

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Pass Marks (SIA:17 + ESE:28)=45

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Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

DATA STRUCTURE THROUGH C++ Theory: 45 Lectures

Introduction: Introduction to Data Structures: Data Types, Abstract Data Types, Array, Arrays an abstractdata type, Arrays row major and column major representation, Algorithm concepts.

Unit - I Linked Lists: Linear List Concepts, Linked List Concepts, Singly Linked List, Doubly Linked List, Circular Linked List, and Linked List Algorithms, Processing a Linked List, Linked List Implementation.

Unit – II Stacks: Basic concepts of Stack, Stack Operations, Stack Array Implementation, and Stack dynamic Implementation. Stack Linked List Implementation, Stack Applications (Expression evaluation, Conversion from infix to prefix and postfix).

Unit – III Queues: Basic concepts of Queue, Queue Operations, Ordinary Queue, Double-Ended Queue, Circular Queue, Priority Queue, Queue Array Implementation, Queue Linked List Design.

Unit - IV Recursion: Factorial–A Case Study, How Recursion Works, Designing Recursive Algorithms, another Case Study- Fibonacci Numbers.

Unit – V Trees Concepts: Basic Tree Concepts, Binary Trees, Binary Tree Traversals (Preorder, In-order, Post-Order), Expression Trees. Binary Search Trees, Operations of Binary Search Trees, AVL Trees, AVL Tree Rotations techniques, AVL Tree Operations.

Unit – VI Graphs: Basic Graph Concepts, Graph Representations (Adjacency matrix, Incident matrix & adjacency lists), Graph Traversals (BFS and DFS).

Unit – VII Heaps & Multiway Trees: Heap Definition, Heap Structure, Heap Data Structure, Heap Algorithms,

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MCA Course CBCS Curriculum M-Way Search Trees, B-Trees, Simplified B-Trees.

Unit – VII Searching & Sorting Concepts: Linear Search, Binary Search, General Sort Concepts, BubbleSort, Insertion Sort, Selection Sort, Quick Sort, Merge Sort.

Text Book:

R. F. Gilberg & B.A. Forouzan- Data Structures: A Pseudocode Approach with C++, 2nd Edn,Brooks/Cole-Thomson Learning, Indian Reprint.

Reference Books:

E. Horowitz et.al-Fundamentals of Data Structures in C++, Galgotia Publication, New Delhi

A. M. Berman- Data Structures vie C++, Oxford Univ. Press, Inc. Indian Reprint

M. T. Goodrich et.al- Data Structures and Algorithms in C++, John Wiley, Inc. Indian Reprint

IV. <u>CORE COURSE - [CCMCA104]</u>:

(Credits: Theory-03)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for <u>Mid</u> Semester Examination (MSE):

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be veryshort answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

DATABASE MANAGEMENT SYSTEM

Theory: 45 Lectures

Unit 1: Introduction:

File systems versus Database systems, Advantages of DBMS, DBMS classification/types, DBMS structure, three schema DBMS architecture, Data Models, Data Independence, Data abstraction, Database Users, Database Schemas and Database Instances, Views and its advantages, Data dictionary, DBA and its functions, RDBMS, Difference between DBMS and RDBMS.

Unit 2: E-R-Model & Relational Model:

Entities and Entity Sets, Relationships and Relationship Sets, Mapping Cardinality, ER Diagram, ReducingER Diagram to tables, Specialization, Generalization and Aggregation. Codd's rule, RDBMS Concepts, Types of Keys, Constraints Types, Relational database Scheme, Procedural & Non Procedural Languages, Relational Algebra, Relational Calculus.

Unit 3: SQL/PLSQL:

Basic Concepts, Basic SQL, Advance SQL, Database languages, Set operations, Aggregate Functions, Null Values, views, Sub-queries, Integrity Constraints(Entity integrity, Referential integrity and Domain constraint), SQL Constraints Types, Indexing, Cursors, Stored procedures and triggers.

Unit 4: Database Design:

Pitfalls in relational database design, Normalization using functional dependency, Multivalued and join dependencies, Atomic values, Full and Partial Functional Dependency, 1NF, 2NF, 3NF, BCNF, 4NF, 5NF.

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Unit 5: Transaction Processing and Concurrency Control:

DBMS Transaction, ACID Properties, States of Transaction, Serializability, DBMS Concurrency control, DBMS deadlock, Deadlock avoidance, Deadlock detection, Deadlock Prevention, , Schedules and Recovery, Locking and Timestamp Ordering for concurrency control. **[Q-1]**

Text Book:

1. Fundamentals of Database Systems "RamezElmasri", Pearson Education.

Reference Books:

1. Database Systems Concepts "A. Silberschatz,Korth", McGraw Hill.

- 2. Database Management Systems by RaghuRamakrishnan and Johannes Gehrke
- 3. SQL Solutions for IBM DBMS (Vnr Computer Library) by Bruce L. Larson
- 4. Database Management Systems (DBMS) by Icon Group International

5. Database Systems Concepts "KORTH"

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100

Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for

Mid Semester Examination (MSE):

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be veryshort answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

COMPUTER SYSTEM ARCHITECTURE Theory: 45 Lectures

Unit I - Parts of A Computer: Processor (CPU), memory subsystem, peripheral subsystem. The memory interface: memory subsystem. Parts of these interfaces integrated with the processor, and the remainder contained in the chip – set that supplements the processor. Two main parts of the processor apart from these interfaces: data path and control (which supervises the data path).

Unit II - Number System and Digital Logic Circuits:-

Number System: -Introduction, Number Systems, and Conversion between Number bases: ArithmeticSystem, Signed and Unsigned Numbers, Binary Coding.

Digital Logic Circuits: -Logic gates, Boolean algebra, Combination Circuits and Sequential Circuits, all types Flip-flops.

Digital Components: -IC, Decoders, Multiplexers

Unit – III Instruction Set Formats: Three–address and one address instructions and the corresponding data – path architectures, namely, general – purpose register architecture (the classic RISC) and accumulator architecture. Zero – address instructions and the stack architecture. Two – address instructions.

Unit – IV Introductory Machine: Modern computer design, Machines dating back to the1980's, reduced instruction set computers (RISC), complex instruction set computers (CISC).

Unit - V Hierarchy of Memory: Performance tradeoffs: fast, small, expensive memories (static RAM); slower, larger, inexpensive memories (DRAM); very slow and very cheap memories (magnetic and opticaldisks). Ideal memory: fast, inexpensive, unbounded size. Virtual memory, Cache memory.

Unit - VI Pipelining & Peripherals: Improving the performance of a computer and increasing the usage of its subsystems by executing several instructions simultaneously. Analogy to assembly line. Influence of instruction

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set design on ease of pipelining. Difficulties with pipelining: structural, data and branch hazards.Branch prediction. Interconnecting peripherals with memory and processor.

Reference Books:

Computer System and Architecture Morishmano Computer Fundamentals-Architecture and Organisation-B. Ram Modern Computer Architecture-Galgotia Computer Systems Organisation and Architecture-John D. Carpinelli, Pearson Computer System Architecture-P.V.S. Rao, PHI Advanced Computer Architecture-A system design approach, Richard Y.Kain, Pearson

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PRACTICAL'S ON CORE – [CPMCA106]:

Nilamber-Pitamber University, Medininagar (Credits: Practical -02)

Marks: 30 (SIA: 20 Exp. + 10 Viva) + 70 (ESE Pr: 6Hrs)=100

Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for Semester Internal Assessment (SIA):

There will be **two** questions in Practical Examination of 3Hrs.out of which **any one** is to be answered. The questions in practical examination will be of equal to 20 marks and will be so framed that the students are able to answer themwithin the stipulated time. 10 marks will be awarded on the performance in viva voce.

End Semester Practical Examination (ESE Pr):

Lab: There will be **four** questions in Practical Examination of 3Hrs.out of which **any two** are to be answered. Student haveto Answer the given questions on Answer booklet and execute the answered programs/steps in computer with standard output.

The questions in practical examination will be of equal to 50 marks and will be so framed that the students are ableto answer them within the stipulated time. 10 marks will be awarded on the performance in viva voce whereas 10 marks will be awarded on cumulative assessment which is further subdivided as 5 marks for Practical record and 5 marks for Attendance.

Assignment: The Assignment should be hand written (preferred)/ typed in A4 size paper. First three pages (i.e. front page+ acknowledgment + index) & Bibliography may be printout. <u>No Xerox copy is allowed.</u>

Marks Distribution:

LAB(Experiment + Answer script)	= 50 marks
Assignment/ Project + Attendance	=10 marks
Viva-voce	=10 marks
Note:	

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

LAB ON UNIX/LINUX COMMAND & SHELL PROGRAMMING

Practical: 30 Hours

Unit – I UNIX Architecture and Command Usage: UNIX Architecture, Features, POSIX and single UNIX Specification, Locating Commands, Internal and External Commands, Command Structure, Flexibility of Command Usage, Man browsing and Documentation, man-k, apropos, whatis.

Unit – II General Purpose Utilities: cal, date, echo, printf, bc, script, Email Basics, mailx, passwd, who, uname, tty, sty.

Unit – III The File System: The File, The Parent-child Relationship, The HOME Variable, pwd, cd, mkdir, rmdir, Absolute and Relative Pathname, **ls**, The UNIX File System.

Unit - IV Handling Ordinary Files : Cat, cp, rm, mv, more, The Ip Subsystem, file, wc, od, cmp, comm, diff, dos2unix, unix2dos, Compressing and Archiving Files, gzip, gunzip, tar, zip, unzip.

Unit – V Basic Files Attributes: ls –l, ls –d, File Ownership and Permissions, chmod,Directory Permissions, Changing File Ownership.

Unit – VI The vi Editor: vi Basics, Input Mode, Saving Text and Quitting, Navigation, Editing Text, Undoing

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Last Editing Instruction (U and U), Repeating Last Command(.), Searching for Pattern(/ and ?), Substitution-Search and Replace(:s).

Unit - VII The Shell : Shell's Interpretive Cycle, Shell Offerings, Pattern Matching, Escaping and Quoting, Redirection- The 3 standard files, /dev/null and /dev/tty, Pipes, tee, Command Substitution, ShellVariables.

Unit - VIII The Process: Process Basics, **ps**, System processes(-e or–a), Mechanism of Process Creation, Internal and External Commands, Process States and Zombies, Running Jobs in Backgrounds, **nice**, Killing Processes with Signals, Job Controls, **cut**, **paste**, **sort**, **uniq**, **tr**.

Unit - IX Essential Shell Programming :Shell Scripts, read, Command Line Arguments, exit and Exit Status of Commands, Logical Operation && and ||, The if Conditional, Using test and [] to evaluate Expressions, The case conditional, expr, \$0, while, for, set and shift, The Here Document, trap,Debugging Shell Script with set -x, Sample Validation and Data Entry Scripts.

Reference Books:

Sumitabha Das- Unix Concepts & Applications, Tata McGraw Hills. Lowell Jay Arthur & Ted Burns-Unix Shell Programming, Galgotia Publication

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Marks: 30 (SIA: 20 Exp. + 10 Viva) + 70 (ESE Pr: 6Hrs)=100

Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for

Semester Internal Assessment (SIA):

There will be **two** questions in Practical Examination of 3Hrs.out of which **any one** is to be answered. The questions in ractical examination will be of equal to 20 marks and will be so framed that the students are able to answer themwithin the stipulated time. 10 marks will be awarded on the performance in viva voce.

End Semester Practical Examination (ESE Pr):

Lab: There will be **four** questions in Practical Examination of 3Hrs.out of which **any two** are to be answered. Student haveto Answer the given questions on Answer booklet and execute the answered programs/steps in computer with standard output. The questions in practical examination will be of equal to 50 marks and will be so framed that the students are able to answer them within the stipulated time. 10 marks will be awarded on the performance in viva voce whereas 10 marks will be awarded on cumulative assessment which is further subdivided as 5 marks for Practical record and 5 marks for Attendance.

Assignment: The Assignment should be hand written (preferred)/ typed in A4 size paper. First three pages (i.e. front page+ acknowledgment + index) & Bibliography may be printout. <u>No Xerox copy is allowed.</u>

Marks Distribution:

LAB(Experiment + Answer script)	=50 marks
Assignment/ Project + Attendance	=10 marks
Viva-voce	=10 marks

Note:

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

LAB ON DATA STRUCTURE THROUGH C++

Students are expected to do programming for followings:

- a. Array Implementation:
 - i. Insertions and Deletions elements in existing array.
 - ii. Transpose of a Matrix.
 - iii. Summation of left diagonal and right diagonal of a square matrix.
 - iv. Maximum and Minimum value from a matrix.
 - v. Multiplications of two Matrixes.
 - vi. Summation of two Matrixes.
- b. Stack Implementation:
 - i. Static Implementations of Stack.
 - ii. Dynamic Implementation of Stack.
 - iii. Linked List Implementation of Stack.
- c. Queue Implementation(Ordinary, DEQUE & Circular)
 - i. Static Implementations of Queue.
 - ii. Dynamic Implementation of Queue.
 - iii. Linked List Implementation of Queue.
 - iv. Link List Implementation (Singly, Doubly, Circularly)
 - v. Various Trees Implementation.
 - vi. Sorting Implementation
 - Bubble sort, Insertion sort, Selection Sort, Exchange sort, Merge Sort, Quick sort.

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Practical: 30 Hours

vii. Searching implementation

• Linear search and Binary Search

Reference Books:

S.K. Srivastava, Deepali Srivastava- Data Structure through C, BPB Publication.

VIII. <u>PRACTICAL'S ON CORE- [CCMCA108]</u>:

(Credits: Practical-03)

Marks: 30 (SIA: 20 Exp. + 10 Viva) + 70 (ESE Pr: 6Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for Somester Internal Assessment (SIA):

Semester Internal Assessment (SIA):

There will be **two** questions in Practical Examination of 3Hrs.out of which **any one** is to be answered. The questions in Practical examination will be of equal to 20 marks and will be so framed that the students are able to answer themwithin the stipulated time. 10 marks will be awarded on the performance in viva voce.

End Semester Practical Examination (ESE Pr):

Lab: There will be **four** questions in Practical Examination of 3Hrs.out of which **any two** are to be answered. Students have to Answer the given questions on Answer booklet and execute the answered programs/steps in computer with standard output. The questions in practical examination will be of equal to 50 marks and will be so framed that the students are able to answer them within the stipulated time. 10 marks will be awarded on the performance in viva voce whereas 10 marks will be awarded on cumulative assessment which is further subdivided as 5 marks for Practical record and 5 marks for Attendance.

Assignment: The Assignment should be hand written (preferred)/ typed in A4 size paper. First three pages (i.e. front page+ acknowledgment + index) & Bibliography may be printout. <u>No Xerox copy is allowed.</u>

Marks Distribution:

LAB(Experiment + Answer script)	= 50 marks
Assignment/ Project + Attendance	=10 marks
Viva-voce	=10 marks
NT	

Note:

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

DBMS LAB

Practical: 30 Hours

SINGLE TABLE RETRIEVED / UPDATION

- a. Select all information from Emp.
- b. List all employees having salary within 1000 to 2000.
- c. Display different job types.
- d. List the employees in certain dept in alphabetical order.
- e. Display all employees with DR or LL in their names.
 - f. List an employee who has a job title of CLERK and earns more than \$1100.
 - g. Update the Emp table and sets the department number for employees 7782 to 10.
 - h. Delete the development department from department table.
 - i. To retrieve name, salary and commission of employees where salary is less than or equal to their commission amount.
 - j. Display name &job title of all employees whose title is not CLERK, MANAGER or ANALYST.

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Function & Concatenation

- 1. Display name, salary and commission of all employees whose monthly salary is greaterthan their commission.
- 2. Select SMITH HAS WORKED IN POSITION OF CLERK IN DEPT 20
- 3. Produce the following

Employee	and	job
SMITH		CLERK
ALLEN		SALESMAN
1 0 11 1		

- 4. Produce the following
 - a. SMITH (CLERK)
 - b. ALLEAN (SLAESMAN)
- 5. Find the maximum, minimum and average salaries of all employees.
- 6. Find how many managers are there without listing them.
- 7. Find out difference between highest and lowest salaries.
- 8. Find all departments which have more than 3 employees.
- 9. Calculate remainder of the ratio of salary to commission for all employees whose job titleis a salesman.
- 10. List all the employees name and salaries increased by 15% and expressed as a whole number of dollars.

JOIN/ HAVING /GROUP BY /ORDER BY

- 1. List all the maximum and minimum salary of each job type.
- 2. Show only employees on grade 3.
- 3. Show all employees in DALLAS.
- 4. Display all employees name and department names in department name order.
- 5. List the following details of employees who earn & 36000 a year or who are clerks.
- 6. To display kings employee number, department number and department location.
- 7. Display the department that has no employees.
- 8. Display the employees who earn less than their managers.
- 9. Display the name, location and departments of employees whose salary is morethan 1500 a month.
- 10. Find all employees who joined before their manager.
- 11. Find the average salary and average total remuneration of each job type.

Oueries using Data Functions

- 1. Display each employee name & hire date of Dept 20 hire date should be like June, Thirteenth1983.
- 2. Display each employee name & hire date and salary review date, Assume salary review date is 1 year from hire date .output should be in ascending review date.
- 3. Compare the hire date for all employees who started in 1987.display the employee no,hire date and month started using the ROUND and TRUNC function.

Nested gueries

- 1. Display the employee name, job, salary of all employees whose salary is equal to minimum salary.
- 2. Display the five highest salaries in the company. Display the name and salary.

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- 3. Find the employees .who earn the highest salary in each job type, sort in descending order of salary.
- 4. Find the employees .who earn the minimum salary for their job. Display the result descending orderof salary.
- 5. Find the most recently hired employees in the department order by hire date.

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- 6. Display details of employees who earn greater than the average of their department. Display the average salary also.
- 7. Display the employee name, job, salary of all employees whose salary is equal to minimum salary.
- 8. Display all the departments that have a minimum salary greater than that of department 20.
- 9. Display the employees whose salary is less than any clerk and who are not clerks.
- 10. Write a query to display a ' * ' against the row of the most recently hired employee

11. Display ENAME, HIRE DATE and Column (MAXDATE) showing

ENAME	HIREDATE	MAXDATE
SMITH	13-JUN-83	
JAMES	23-JUL-84 *	

USING THE & SUBSTITUTION VARIABLE

NOTE –1. Use a variable prefixed with an ampersand (&) to prompt the user for a value. 2. Use single quotation marks for date and character value.

- 1. Create SQL statements to prompt the user for an employee number at runtime and displays employees s number, name, salary and department number for that employee .
- 2. Do a case sensitive search for a list of employee with a job that a job that the user enters.
- 3. Display the employee number and any other column and any conditions of employees specified by the user at a runtime from EMP Table.

Reference Books:

An Introduction to Database System, C.J. Date, A. Kannan, S. Swamynathan, Pearson Database System Concept, Silberschtz, Korth and Sudershan. SQL/PL-SQL Ivan Bayross SQL/PL-SQL Deshpandey

SEMESTER II

10 Papers

Total 100 x 10 = 1000 Marks

I. LANGUAGE ELECTIVE - I [ECMCA201]:

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for <u>Mid</u> <u>Semester Examination (MSE):</u>

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be veryshort answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

JAVA PROGRAMMING

Unit I Fundamentals of Java programming: Introduction to Object Oriented Programming Language, Difference with C and C++, Benefits and Applications of OOP. Introduction to Java, Basic features of Java, Java Program Structure, JDK Tools, Java standard Library (JSL), Java Virtual Machine (Byte codes),

Unit II Java Tokens, Variables, Scope of Variables, Keywords, Identifiers, Punctuation Symbols, Unicode Characters, Data Types, Operators, Decision Making and Looping (if, if else, Nested if, if else-if else ladder, switch case, for, while, do while, break, & continue).

Class, Object, Constructors, Method Overloading, Inheritance, Overriding Methods, This and Super, Final Variables and Methods, Final Classes, Abstract Methods and Classes, Visibility Control

Unit III Class and Object: Declaring a Class, Creating an Object, Methods, Exploring new Operator, constructor its types, final, this Keyword, Recursion, Access Specifiers, Inheritance its types, super Keyword, Polymorphism, Overriding Methods, Runtime Polymorphism, Implementing Abstract classes, packages and interfaces.

Unit IV String: Concatenation and Changing Case, Sub strings Data Conversion String Buffer, Types of Array, Array of Objects, Wrapper Class, Vector Class.

Unit V Exception Handling and Threads: Errors, Types of Errors, Exceptions, Exception handling code(Try, Catch and finally), Throwing our own Exception. Introduction to Threads, Creating Threads, Extending the

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(Credits: Theory-03)

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Theory: 45 Lectures

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Nilamber-Pitamber University, Medininagar CBCS Curriculum Thread Class, Stopping and Blocking a Thread, Life Cycle of a Thread and Thread Priority

Unit VI File input and Output: File Class, Byte Stream Classes Reading from and Writing to a File, Character Stream Classes, Random Access File, Sequence Input Stream, Binary files.

Data Base Connectivity: ODBC API, JDBC Application Architecture, Java. SQL, obtaining a connection, step connecting Object, Working with Result, statement.

Unit VII Graphical User Interfaces: Creating User Interfaces, Overview of a Java GUI, Developing a Java GUI, Adding Functionality to a GUI, Improving GUI Layout.

Reference Books:

"An Introduction to Java Programming and Object Oriented Application Development" –Richard A. Jhonson. Detail-Java How to Program, Pearson Education, New Delhi. E. Balagurusamy-Java Programming, TMH, New Delhi, 2005. James M. Sleek- Programming and Problem Solving with Java, Thomson Learning, Indian Edition, . Herbert Schildt- The Complete Reference, TMH

DIGITAL IMAGE PROCESSING

Theory: 45 Lectures

Objectives: The objective of this course is to provide the students a general understanding of the fundamentals of digital image processing. It also introduces analytical tools which are currently used in digital image processing. By the end of the course student will be able to develop any software/programs that uses image restoration, enhancement and compression etc.

Pre-requisites: Computer Graphics, Set theory and Probability.

Course Outcomes (CO):

CO1	Students will able to understand the		
	real life Image processing problems.		
CO2	Students will be able to understand		
	the concepts of transformations and		
	Fourier theory.		
CO3	Students will able to develop their		
	own software in Digital Image		
	processing area.		

UNIT-I

Introduction

Digital image representation, Fundamental steps in Image Processing, Elements of DIP systems.

Digital Image Fundamentals

Elements of Visual Perception, Sampling and Quantization, Relationships between pixels, Linear and Nonlinear operations.

Image Enhancement in Spatial domain

Enhancement by Point Processing, Histogram Processing, Spatial Filtering.

Image Enhancement in Frequency Domain

Introduction to the Fourier Transform, The discrete Fourier Transform, Properties of the two-dimensional Fourier Transform, Smoothing Frequency-domain filters, Sharpening Frequency domain filters.

UNIT-II

Image Compression

Fundamentals, Image Compression Models, Error Free Compression, Lossy Compression.

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Image Segmentation

Threshold Techniques: Global, Adaptive and Optimum thresholding, Edge detection, Region Growing. **Representation and Description** Representation Schemes, Boundary Descriptors, Regional Descriptors.

Object Recognition

Patterns and Pattern Classes, Recognition based on Decision-theoretic methods, structural methods.

Text Books:

1. Rafael C Gonzalez, Richard E Woods, Digital Image Processing, Pearson Education.

2. Rajjan Shinghal, Pattern Recognition, Oxford.

Reference Books:

- 1. Chanda and Majumder, Digital Image Processing and Analysis, Prentice Hall.
- 2. Rafael C Gonzalez, Richard E Woods, Digital Image Processing with Matlab, Pearson Education.
- 3. S. Sridhar, Digital Image Processing, Oxford University Press.
- 4. Jayaraman, Digital Image Processing, Tata McGraw Hill.

II. <u>CORE COURSE – [CCMCA202]</u>:

(Credits: Theory-03)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for <u>Mid</u> <u>Semester Examination (MSE):</u>

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be very short answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

DISCRETE MATHEMATICS WITH GRAPH THEORY Theory: 45 Lectures

Unit I Mathematical Preliminaries: Euclid's Algorithm, Fundamental Theorem of Arithmetic, Euclid's theorem, Congruence Modulo m, Fermat's & Euler's Theorems, Exponents & Logarithms.

Unit II Sets Concepts: Definition, Elements, Notations & construction of sets, Types of sets, set operations& properties, venn diagram, De-Morgan's laws.

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MCA Course CBCS Curriculum Nilamber-Pitamber University, Medininagar Unit IIIFuzzy Algebra: Introduction, crisp sets & fuzzy sets, operation of fuzzy sets, union & intersection of two intervals- valued fuzzy sets, fuzzy relation.

Unit IV Combinatorics: Basic counting Principles, Factorial, permutation & combination, pigeonhole& extended pigeonhole principle, binomial theorem, combinatorial identities, multinomial coefficient.

Unit V Mathematical logic: propositions, connectives, equivalence of formula, well formed formula, tautologies', principle of duality, Normal form, Methods of proof, Mathematical Induction (M.I.),Predicate Calculus.

Unit VI Relation & Function: product sets, partition, binary relation in a set, domain & range, the matrix of relation & digraph, path in relation & digraph, Boolean matrices, Adjacency matrix of a relation, properties of relation, equivalence relation, Warshall's algorithm.

Sum & product of function, types of functions, compositions of function, inverse of functions, permutation function.

Unit VII: Lattice theory: Partial order set- Hasse diagram, isomorphism, duality, product of two sets, Lattice as poset- lattices as algebraic system, complete lattice, bounded lattice, sub lattice.

Unit VIII: Graph Theory: Introduction, graph basics, digraph, sub graph, circuit & cycle, multiple path, connected Graph, eulerian graph, Hamiltonian graph, biconnected graph, Algebraic terms& operations used in graph theory. The Konigsberg Bridge problem, four color problem, three utilities problem.

Unit IX: Trees: Definitions, Forest, Rooted Graph, Properties of tree, Binary tree, spanning tree,BFS & DFS, Minimal spanning trees- Kruskal's Algorithm, Prim's Algorithm, Directed tree.

Reference:

Discrete Mathematics with Graph theory, S.K. Yadav, Ane's Books Pvt. Ltd.

Graph Theory with Application, Bondy, J.A & U.S.R. Murty [1976], MacMillan

Kolman, Busby, Ross, Rehmann: *Discrete Matheamatical Structures*, 5/e, Pearson Education, 2006. *Discrete Mathematics, Swapan Kumar Chakraborty, bikashkantisarkar, Oxford University Press*

III. CORECOURSE-[CCMCA203]:

(Credits:Theory-03)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100

Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for

Mid Semester Examination (MSE):

There will be two groups of questions in written examinations of 20 marks. Group A is compulsory and will containfive questions of very short answer type consisting of 1 mark each. Group B will contain descriptive type five questions of

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CBCS Curriculum five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be veryshort answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

SOFTWARE ENGINEERING

Theory: 45 Lectures

Unit -I Software Engineering Basics : Introduction to software engineering, Software components, Software characteristics, Software crisis, Software Engineering Process, Evolving Role of Software, Changing Nature of Software, Legacy Software, Software Engineering – A layered Technology.

Unit -II Introduction to Software Projects, Project Management Introduction, Software Development Life cycle(SDLC), Process Frame work, Process Patterns, Process Models, Waterfall Model, Incremental Process Models, Evolutionary Process Models, Specialized Process Models, Unified Process Model, AgileProcess Model.

Unit –III Requirement Engineering: An approach to design and construction, Requirement specification, Initiating the Requirement Engineering Process, Functional and Non Functional Requirements, DevelopingUse case, Building the Analysis Model, Negotiating Requirements, Validating Requirements, SRS document, IEEE standards for SRS.

Unit –**IV Design Engineering:** Design Process Approaches, Design Concepts, Quality, Design Models, Pattern Based Software Design. Software design approaches, Cohesion and Coupling, Software Design Object oriented vs Function Oriented designs. User Interface Design -Input and Output Interfaces, Component -Based GUI Development, a User Interface design Methodology.

Unit – **V** Coding: Coding standards and guidelines, Code review, Code walkthrough and code inspection.

Unit –VI Testing Strategies and Testing Tactics: Strategic Approach to software Testing, Test Strategies for conventional and Object Oriented Software, Validation Testing System Testing, Requirement based testing, Acceptance testing, White Box Testing(structural testing), Basis Path Testing, Control Structure Testing, Black Box Testing(functional testing), Object Oriented Testing Methods, Test coverage, Test plan

Unit -VI Metric for process and Estimation Techniques: Process metrics, software size oriented metrics, Function point based measures, cyclomatic complexity measures, Software Project Estimation, Decomposition Techniques, Empirical Estimation Models, Estimation for Object Oriented Projects Specialized Estimation Techniques, COCOMO models.

Unit -VII Software Quality and Configuration Management: Quality Concepts, Software QualityAssurance, Software Reliability, Software Configuration Management, SCM Repository, SCM Process, Quality metrics, Verification and Validation, Version control, Change management, version control.

Computer Aided Software Engineering (CASE) Tools, Types of CASE tools.

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Current trends in Software Engineering – Software engineering for projects and products.

Introduction to web engineering and agile process. Reverse engineering, Re-engineering

Text Book:

Roger S. Pressman – "Software Engineering – A Practitioner's Approach", TMH, 7th Ed.

Reference Books:

R. Fairley – "Software Engineering – Concepts –TMH, 2nd Ed.Rajib
Mall, "Software Engineering" PHI.
P. Jalote" An Integrated Approach to Software Engineering", Narosa.R.Khurana,
"Software Engineering", Vikas Publishing House.
Ian Sommerville – "Software Engineering", 7thEdn., Pearson Education.

IV. <u>CORE COURSE - [CCMCA204]</u>:

(Credits: Theory-03)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for <u>Mid</u> <u>Semester Examination (MSE):</u>

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be veryshort answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

AUTOMATA THEORY

Theory: 45 Lectures

Unit –I Finite Automata : Finite Automata, capability & limitations of FSM, Deterministic Finite Automata , Non-Deterministic Finite Automata, NFA with e-moves, Equivalence of DFA and NDFA, NFAfrom regular expressions, regular expressions from DFA, Moore versus Mealy m/c , Kleen's Theorem.

Unit – II Regular languages & Regular Grammars : Regular Expressions- Formal Definition & Language

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MCA Course CBCS Curriculum Nilamber-Pitamber University, Medininagar associated with It. Criterion for Regularity, Relation between Regular expression & Regular Language , Closure properties of regular grammar. Identifying Nonregular Language-using pigeonhole principle, Pumping Lemma.

Unit – III Context Free Grammars: Introduction, definition, Regular Grammar, Derivation trees, Ambiguity, Normal Forms, Applications.

Unit – IV Pushdown Automata : Definition, Moves, Instantaneous Descriptions, Language recognized by PDA, Deterministic PDA, Acceptance by final state & empty stack, Equivalence of PDA, Pumping lemma for CFL, Intersection and Complements of CFL.

Unit – V Turing Machines: Definition and examples, Computing Partial Functions with Turing Machine(TM), Combining TMs, Variations of TMs, Multi-tape TMs, Non-deterministic TM, Universal TM, Church Thesis.

Unit – VI Recursively Enumerable Languages: Recursively Enumerable and Recursive, Enumerating Language, Context Sensitive and Chomosky Hierarchy.

Unit – VII Unsolvable Problems and Computable Functions: Non-recursive Language and unsolvable Problems, Halting Problem, Rice Theorem, Post Correspondence Problem.

Text Books:

J.E. Hopcroft and J.D. Ullman -"Introduction to Automata Theory, Languages & Computation", Narosa.

Reference Books:

K.L.P Mishra & N. Chandrasekharan -"Theory of Computer Science", PHI

Peter Linz -- "An Introduction to Formal Language and Automata", Narosa

C.K. NAGPAL- Formal Language & Automata Theory, Oxford University Press

Vivek Kulkarni- Theory of Computation, Oxford University Press

DasradhRamaiah K. – Introduction to Automata Theory & Compiler Design, PHI

V. <u>CORE COURSE – [CCMCA205]</u>:

(Credits: Theory-03)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for <u>Mid</u> <u>Semester Examination (MSE):</u>

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of

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CBCS Curriculum five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be veryshort answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

DATA COMMUNICATION AND NETWORKING Theory: 45 Lectures

Unit - I Data Communications and Networking Basics: Fundamental concept of Communications Model, Data Communications & Networking.

Protocol Architecture: A Basic Protocol Architecture, OSI, the TCP/IP Protocol Architecture

Unit - II Transmission of Data: Concepts and Terminology, Analog and Digital Data Transmission, Transmission Impairments, Channel Capacity.

Guided and Wireless Transmission: Guided Transmission Media, Wireless Transmission, Wireless Propagation, Line-of-Sight Transmission.

Unit - III Signal Encoding Techniques: Digital Data Digital Signals, Digital Data Analog Signals, Analog Data Digital Signals, Analog Data Analog Signals.

Digital Data Communication Techniques: Asynchronous and Synchronous Transmission, Types of Errors, Error Detection, Error Correction, Line Configurations, Interfacing.

Unit -IV Data Link Control: Flow Control, Error Control, High-Level Data Link Control (HDLC). Multiplexing: Frequency Division Multiplexing, Synchronous Time Division Multiplexing, Statistical Time **Division Multiplexing**

Unit - V Circuit Switching and Packet Switching: Switching Networks, Circuit-Switching Networks, Circuit-Switching Concepts, Control Signaling, Soft switch Architecture, Packet-Switching Principles, X.25, Frame Relay.

Unit -VI Asynchronous Transfer Model: Protocol Architecture, ATM Logical Connections, ATMCells, Transmission of ATM Cells, ATM Service Categories, ATM Adaptation Layer.

Unit –VI Routing in Switched Networks: Routing in Circuit-Switching Networks, Routing in Packet- Switching Networks, Least-Cost Algorithms

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Text Book :

W. Stallings - Data and Computer Communications, 7thEdn., Pearson Edn./ PHI, New Delhi, 2006

Reference Books:

B. A. Forouzan - Data Communications and Networking, 4thEdn. TMH, New Delhi 2006

P.C. Gupta – Data Communications and Computer Networks, PHI, New Delhi 2006.

VI. CORE COURSE - I [CCMCA206]:

(Credits:Theory-03)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for Mid

Semester Examination (MSE):

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will contain five questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will bevery short answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered. Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

(Attendance Upto75%, 1mark; 75<Attd.<80, 2 marks; 80<Attd.<85, 3 marks; 85<Attd.<90, 4 marks; 90<Attd, 5 marks).

PYTHON PROGRAMMING

Theory: 45 Lectures

Unit I Introduction to Python: The Python Language, The Python Standard Library and Extension Units, Python Implementations, Python Development and Versions, Python Resources.

The Python Language: Lexical Structure, Data types, Variables and Other References, Expression and Operators, Numeric Operations, Sequence Operations, Set Operations, Dictionary Operations, The print Statement, Control Flow Statements, Functions.

Object-Oriented Python: Classes and Instances, Special Methods, Decorators, Meta classes.

Unit II Exceptions: The TRY Statement, Exception Propagation, The Raise Statement, Exception Objects, Custom Exception Classes, Error-Checking Strategies.

Units: Unit Objects, Unit Loading, Packages, The Distribution Utilities (distutils).

Core Built-ins: Built-in types, Built-in Functions, The sys Unit, The copy Unit, The Collections Unit, The Functional Unit, The Bisect Unit, The Heapq Unit, The User Dict Unit, The Optparse Unit, The Itertools Unit. **Strings and Regular Expressions:** Methods of String Objects, The String Unit, String Formatting, The Pprint Unit, The Repr Unit, Unicode, Regular Expressions and the Re Units.

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MCA Course CBCS Curriculum Nilamber-Pitamber University, Medininagar **Unit III File and Text Operations:** Other chapters that also deal with Files, Organization of this Chapter,File Objects, Auxiliary Unit for File I/O, The String IO and String IO Units, Compressed Files, The OS Unit, File System Operations, Text Input and Output, Richer-Text I/O, Interactive Command Sessions, Internationalization.

Persistence and Databases: Serialization, DBM Unit, Berkeley DB Interfacing, The Python Database API (DBAPI) 2.0

Unit IV Time Operation: The Time Unit, The Date Time Unit, The Pytz Unit, The dateutil Unit, Thesched Unit, The calender Unit, Themx. Date Time Unit.

Controlling Execution: Dynamic Execution and the exec Statement, Internal Types, Garbage Collection, Termination Functions, Site and User Customization.

Unit V Thread and Processes: Thread in Python, The thread Unit, The Queue Unit, The Threading Unit, Threaded Program Architecture, Process Environment, Running Other Programs, The map Unit.

Unit VI Numeric Processing: The Math and cMath Unit, The Operator Unit, Random and Pseudorandom numbers, The Decimal Unit, The gmpy Unit.

Array Processing: The Array Unit, Extensions for Numeric Array Computation, The Numeric Package, Array Objects, Universal Functions (ufuncs), Auxiliary Numeric Units.

Reference Books:

1. Alex Martelli- PYTHON IN A NUTSHELL,2ND Edition, O'REILLY, 2012 2. Mark Lutz-Python reference,5thedition,O'Reilly

VII. LANGUAGE ELECTIVE-I LAB [EPMCA207]:

(Credits: Practical-02)

Marks: 30 (SIA: 20 Exp. + 10 Viva) + 70 (ESE Pr: 6Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for

Semester Internal Assessment (SIA):

There will be **two** questions in Practical Examination of 3Hrs.out of which **any one** is to be answered. The questions in ractical examination will be of equal to 20 marks and will be so framed that the students are able to answer themwithin the stipulated time. 10 marks will be awarded on the performance in viva voce.

End Semester Practical Examination (ESE Pr):

Lab: There will be **four** questions in Practical Examination of 3Hrs.out of which **any two** are to be answered. Student haveto Answer the given questions on Answer booklet and execute the answered programs/steps in computer with standard output. The questions in practical examination will be of equal to 50 marks and will be so framed that the students are able to answer them within the stipulated time. 10 marks will be awarded on the performance in viva voce whereas 10 marks will be awarded on cumulative assessment which is further subdivided as 5 marks for Practical record and 5 marks for Attendance.

<u>Assignment</u>: The Assignment should be hand written (preferred)/ typed in A4 size paper. First three pages (i.e. front page+ acknowledgment + index) & Bibliography may be printout. <u>No Xerox copy is allowed.</u>

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MCA Course Marks Distribution:	CBCS Curriculum	Nilamber-Pitamber University, Medininagar
LAB(Experiment + Answer script)	= 50 marks	
Assignment/ Project + Attendance	=10 marks	
Viva-voce	=10 marks	

Note: Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

LAB ON JAVA PROGRAMMING

Practical: 30 Hours

Write a program in java for followings:

- 1. To illustrate Arithmetic, Relational, Boolean, Bitwise, Shift Operators.
- 2. To illustrate Precedence Rule.
- 3. To use "If-else" & "Switch Cases"
- 4. To use "For Loop", "While Loop" & "Do- While loop".
- 5. To use "Break" & "Labeled Break".
- 6. For class declaration & object initialization.
- 7. For calculating "simple interest" using class, object & methods.
- 8. For method overloading.
- 9. For matrix multiplication
- 10. For Nested classes.
- 11. For default constructor
- 12. For parameterized constructor
- 13. For constructor overloading
- 14. For final
- 15. For single Inheritance
- 16. For multilevel inheritance
- 17. For super
- 18. For hierarchical inheritances
- 19. For multiple inheritance using interface class
- 20. For hybrid inheritances using interface class
- 21. For method of overriding.
- 22. For Encapsulation.
- 23. For Abstract Class & Abstract Methods.
- 24. For class implementing interface.
- 25. For using inbuilt packages. E.g. Fact, Static, Import etc.
- 26. For Wrapper classes.
- 27. For Declaration, Creation, Finding Length, Comparison, Region Matching, Index of Character, occurrence of particular string, character at particular position, Test for Equality related to string.
- 28. For Try-Catch, Multiple Catch, Throw &Rethrow Exception, Finally, User Defined Exception, Exception Encapsulation.
- 29. For creating Thread.
- 30. File Handling

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31. Database Connectivity

Reference Books:

Deitel-Java How to Program, Pearson Education, New Delhi. E. Balagurusamy-Java Programming, TMH, New Delhi, 2005.

VIII. CORE COURSE – [CPMCA208]:

(Credits: Practical -02)

Marks: 30	(SIA	: 20 Exp. +	10 Viva)	+ 70 (ESE Pr: 6Hrs)=100	Pass Marks (SIA:17 + ESE:28)=45
Instruction	to	Question	Setter	for	

Semester Internal Assessment (SIA):

There will be **two** questions in Practical Examination of 3Hrs.out of which **any one** is to be answered. The questions in practical examination will be of equal to 20 marks and will be so framed that the students are able to answer themwithin the stipulated time. 10 marks will be awarded on the performance in viva voce.

End Semester Practical Examination (ESE Pr):

Lab: There will be **four** questions in Practical Examination of 3Hrs.out of which **any two** are to be answered. Student have to Answer the given questions on Answer booklet and execute the answered programs/steps in computer with standard output.

The questions in practical examination will be of equal to 50 marks and will be so framed that the students are ableto answer them within the stipulated time. 10 marks will be awarded on the performance in viva voce whereas 10 marks will be awarded on cumulative assessment which is further subdivided as 5 marks for Practical record and 5 marks for Attendance.

Assignment: The Assignment should be hand written (preferred)/ typed in A4 size paper. First three pages (i.e. front page

+ acknowledgment + index) & Bibliography may be printout. <u>No Xerox copy is allowed.</u>

Marks Distribution:

LAB(Experiment +Answerscript)	= 50 marks
Assignment/ Project+Attendance	=10marks
Viva-voce	=10marks

Note:

(Attendance Upto75%, 1mark; 75<Attd.<80, 2 marks; 80<Attd.<85, 3 marks; 85<Attd.<90, 4 marks; 90<Attd, 5 marks)..

LAB ON HTML, CSS, CASE TOOLS

UnitI: Introduction: HTML tags, pairs, singular tags, commands lists, graphics, tables, linking documents, images as hyperlinks, frames.

UnitII: Introduction to HTML5: The canvas, Geolocation, Audio and video, Forms, Location storage, Web workers, Web applications, Micro-data, Creating and accessing a canvas, Writing text to canvas, Usingpaths, Filling areas, Clip method, The is Point In Path method, Working with curves, Manipulating images, Editing at pixel level, Advanced graphical Effects, Transformations.

UnitIII: HTML5 audio and video: About codecs, The <audio> elements, Supporting non- HTML5 browsers,

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Practical: 30 Hours

The <video>element.

UnitIV: Other HTML5 features: Geolocation and the GPS service, Local storage, Web workers, Offline web application, Drag and Drop, Cross document Messaging, Micro-data, HTML5tags.

UnitV: Introduction toCSS: Importing style sheet, Using semicolons, CSS rules, Style types, CSS selectors, CSS cascade, Measurements, Fonts and typography, Managing text styles, CSS colours, Pseudo classes, Shorthand rules, Box model andlayout.

UnitVI: Advanced CSS with CSS3: Attributes Selectors, Box sizing property, CSS3 background, Multiple backgrounds, CSS3 borders, Box shadows, Element overflows, Multicolumn layout, Colours andopacity, Text Effects, Web fonts, Google web fonts, Transformations, 3D transformations, Transitions.

UnitVII: CASE tools: UML DIAGRAM, Class Diagram, Object and class concept, Link, association, Generalization, Inheritance, Aggregation, Collaboration Diagram, Deployment Diagram

State Modeling: Events, States, State diagram, Interaction Model

Interaction Model: Use case model, Sequence Diagram, Activity Diagram.

Reference Books:

David karlins, Dreamweaver CSS.5 Mobile and Web Development with HTML5, CSS3, and JQuery, SPD Richard C.LEE, William M. tepfenhart, UML and C++, PHI Richard C.LEE, William M. tepfenhart, UML and C++, PHI M R Blaha, Rumbaugh, "Object – Oriented Modeling & Design With UML"

IX. CORE COURSE – [CPMCA209]:

(Credits: Practical -02)

Marks: 30 (SIA: 20 Exp. + 10 Viva) + 70 (ESE Pr: 6Hrs)=100Pass Marks (SIA:17 + ESE:28)=45Instruction to Question Setter for

Semester Internal Assessment (SIA):

There will be **two** questions in Practical Examination of 3Hrs.out of which **any one** is to be answered. The questions in practical examination will be of equal to 20 marks and will be so framed that the students are able to answer themwithin the stipulated time. 10 marks will be awarded on the performance in viva voce.

End Semester Practical Examination (ESE Pr):

Lab: There will be **four** questions in Practical Examination of 3Hrs.out of which **any two** are to be answered. Student have to Answer the given questions on Answer booklet and execute the answered programs/steps in computer with standard output.

The questions in practical examination will be of equal to 50 marks and will be so framed that the students are ableto answer them within the stipulated time. 10 marks will be awarded on the performance in viva voce whereas 10 marks will be awarded on cumulative assessment which is further subdivided as 5 marks for Practical record and 5 marks for Attendance.

Assignment: The Assignment should be hand written (preferred)/ typed in A4 size paper. First three pages (i.e. front page

+ acknowledgment + index) & Bibliography may be printout. <u>No Xerox copy is allowed.</u>

Marks Distribution:

LAB(Experiment +Answerscript)	= 50marks
Assignment/ Project+Attendance	=10marks
Viva-voce	=10marks

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Practical: 30 Hours

Note:

(Attendance Upto75%, 1mark; 75<Attd.<80, 2 marks; 80<Attd.<85, 3 marks; 85<Attd.<90, 4 marks; 90<Attd, 5 marks)...

LAB ON NETWORKING

UnitI: CISCO IOS and Command Line Interface (Working with Cisco IOS & CLI commands), Creating a Network(Viewing and Saving Configuration and Assigning IP addresses to network using VLSM and FLSM)

UnitII: Configuring Router(Working with router interface), Securing Router configuration(Setting hostnames and banners Enabling Passwords on router)

UnitIII: Setting up LAB for routing(Setting up lab for configuring Static, default & Dynamic Routing)

UnitIV: Routing Protocols(Setting up lab for RIPV1 RIPV2 IGRP EIGRP OSPF commands)

UnitV: Configuring Switches(Configuring erasing and working with all switching commands)

UnitVI: VLANs(Identifying, configuring VLANs and VTP), Access Lists(Applying standards on Named and Extended Access Lists) **UnitVII:** Frame Relay(Using WAN protocols and Frame Relay)

Reference Books:

T-1 : Cisco Certified Networking Associate Study Guide, Todd Lammle, 7th, 2011, Wiley

R-1 : The Ultimate CCNA Study Guide, Chris Bryant, 6th, 2011, CISCO Press

R-2 : CCNA Security Official Exam Certification Guide, Micheal Watkins, Kevin Wallace, 1st, 2008, CISCO Press

R-3 : CCNA Cisco Certified Network Associate Study Guide, Todd lammle, 7th, 2011, Sybex

R-4 : CCNA: Cisco Certified Network Associate: Fast Pass, Todd lammle, 3rd, 2007, Sybex

X. PRACTICAL'S ON CORE – [CPMCA210]:

(Credits: Practical-02)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for

Mid Semester Examination (MSE):

There will be two groups of questions in written examinations of 20 marks. Group A is compulsory and will containfive questions of very short answer type consisting of 1 mark each. Group B will contain descriptive type five questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will bevery short answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

There may be subdivisions in each question asked in Theory Examinations Note:

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

(Attendance Upto75%, Imark; 75<Attd.<80, 2 marks; 80<Attd.<85, 3 marks; 85<Attd.<90, 4 marks; 90<Attd, 5 marks).

LAB ON PYTHON PROGRAMMING

Programming based on the following:-

- 1. Data types, Variables and Other References, Expression and Operators,
- 2. Numeric Operations, Sequence Operations, Strings, Tuples, List, Set Operations, Dictionary Operations,
- 3. The print, Control Flow Statements, while, for, break, continue for, pass try, raise, with
- 4. Functions, lambda expressions, generators, attributes.

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Practical: 30 Hours

MCA Course

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- 5. Classes and Instances, bound, unbound, overriding, superclass Methods, Decorators, Metaclasses.
- 6. Try, raise, with exceptions, Exceptions objects, Standard and custom Exception classes.
- 7. Units, Import, from, import*, statements, Python built-in Units sys, copy, Collections Unit, Functional Unit, Bisect Unit, Heapq Unit, User Dict Unit, Optparse Unit, Itertools Unit.
- 8. Methods of String Objects, String Unit, String Formatting, Pprint Unit, Repr Unit, Unicode, Regular Expressions and the Re Units.
- 9. File and Text Operations: Creating aFiles object with open, Auxiliary Unit for File I/O, The StringIO and cString IO Units, Text Input and Output, Richer-Text I/O, Interactive Command Sessions, Internationalization.
- 10. Persistence and Databases: marshal, pickle, any dbm Unit, The Python Database API
- 11. Time Operation: time, datetime, pytz, dateutil, sched, calender, mx. Date Time Unit.
- 12. Controlling Execution: exec Statement, co, _code, co_filename, code_object, gc Unit,weakref, proxy, register.
- 13. Thread and Processes: thread, Queue, Threading, map Unit.
- 14. Numeric Processing: The math and cmath Unit, operator Unit, Random and Pseudorandomnumbers, Decimal, gmpy Unit.
- 15. Array Processing: array Unit, extensions for Numeric Array Computation, Numeric Package, Array Objects, Universal Functions (ufuncs), Auxiliary Numeric Units.

Reference Books:

Alex Martelli- PYTHON IN A NUTSHELL,2ND Edition, O'REILLY, 2012

SEMESTER III

11 Papers

Total : 100 x 11 = 11000 Marks

I. LANGUAGE ELECTIVE - II [ECMCA301]:

(Credits: Theory-03)

Pass Marks (SIA:17 + ESE:28)=45

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100

Faculty MCA Course, NPU Medininagar Director MCA Course, NPU Medininagar

Instruction to Question Setter for <u>Mid</u> <u>Semester Examination (MSE):</u>

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be veryshort answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered. Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

ADVANCE JAVA PROGRAMMING

Theory: 45 Lectures

Unit I Components and Facilities or Rich Graphical User Interface: Programming with the JFC, Swing API Components, JComponents Class, Dialog boxes, Panels, Labels, Checkboxes, Menus, Toolbars and Actions, Sliders, Spinners, Progress bars, Scrollbars, List and Combo boxes, Text-entry Components, Colour and File Choosers, Tables and Trees, Printing with 2D API, Java Print Service API.

Unit II Using Relational Database: Introduction, Best Practices for Programming for Databases, JDBC Drivers for RDBM Systems, SQL to Java type Mapping, Understanding the Database used in this chapter, Using the **javas.sql** API, Coding Transactions, Using the **javas.sql** API, Connection Pooling.

Unit III XML: Introduction, XML structure, XML example document with SAX, Parsing an XML Document with DOM, Generating an XML document with DOM, Validating XML Documents using DTD and XML schema, Transforming XML using XSLT.

Unit IV Building Web Applications: Introduction, The technology of Web, J2EE Web Application Packaging, Servlets, The Servlet API, The User Experience, Building a Web App with Continuity, Framework for BuildingWeb Applications, Building Robust Web Apps.

Unit V Enterprise JavaBeans: Introduction, Enterprise Programming, what are EJBs? Session EJBs, EJB Clients, Entity EJBs, Message Driven Beans, EJB Transactional Characteristics, EJB Security, Best Practices for Designing EJB-Based Application.

Reference Books:

Wigglesworth & McMillan – JavaTM Programming Advanced Topics, 3rdEdn., India Edition, Thomson Education, New Delhi, 2007

Uttam K. Roy- Advanced Java Programming, Oxford University Press, 2015

MANAGEMENT INFORMATION SYSTEM

Theory: 45 Lectures

Faculty MCA Course, NPU Medininagar

Objectives: The main objective of this course is to describe the use and function of Management Information Systems, describe and evaluate Information Systems Development processes and techniques. It also identifies and evaluates hardware and software requirements for Information Systems, Data Management technologies and the security risks associated with Management Information Systems.

Pre-requisites: DBMS, Programming skills with any programming language.

Course Outcomes (CO):

CO1	Students will able to apply fundamental business analysis						
	methods to understand the organizational and economic						
	characteristics of organizations.						
CO2	Students will be able to Model real-world situations for						
	information systems support.						
CO3	Students will able to develop a software and can use						
	fundamental concepts of information systems and technology.						

UNIT – I

Organization and Information Systems [6 hrs.]

Changing Environment and its impact on Business - The IT/IS and its influence - The Organization: Structure, Managers and activities - Data, information and its attributes - The level of people and their information needs -Types of Decisions and information - Information System, categorization of information on the basis of nature and characteristics.

Kinds of Information Systems [6 hrs.]

Transaction Processing System (TPS) - Office Automation System (OAS) - Management Information System (MIS) - Decision Support System (DSS) and Group Decision Support System (GDSS) - Expert System (ES) - Executive Support System (EIS or ESS).

System Analysis and Development and Models [8 hrs.]

Need for System Analysis - Stages in System Analysis - Structured SAD and tools like DFD, Context Diagram Decision Table and Structured Diagram. System Development Models: Water Flow, Prototype, Spiral–Roles and responsibilities of System Analyst, Database Administrator and Database Designer.

UNIT – II

Enterprise System [7 hrs.]

Enterprise Resources Planning (ERP): Features, selection criteria, merits, issues and challenges in Implementation- Supply Chain Management (SCM): Features, Modules in SCM - Customer Relationship Management (CRM) and its Phases.

Knowledge Management and E-Governance [6 hrs.]

Choice of IT Nature of IT decision - Strategic decision - configuration design and evaluation Information technology implementation plan. 52

MCA Course

CBCS Curriculum

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Security and Ethical Challenges [7 hrs.]

Ethical responsibilities of Business Professionals – Business, technology. Computer crime – Hacking, cyber theft, unauthorized use at work. Piracy – software and intellectual property. Privacy – Issues and the Internet Privacy. Challenges – working condition, individuals. Health and Social Issues **Text Books:**

1. Kenneth J Laudon, Jane P. Laudon, Management Information Systems, Pearson.

2. W. S. Jawadekar, Management Information Systems, Tata McGraw Hill.

Reference Books:

- 1. James A O' Brien, Introduction to Information System, Tata McGraw Hill.
- 2. S. Sadagopan, Management Information Systems, PHI.
- 3. Effy Oz, Management Information Systems, Thomson Course Technology.
- 4. Lynda M Apple Gate, Robert D Austin Corporate Information Strategy and Management, Tata McGraw Hill.

II. <u>COURE COURSE - [CCMCA302]</u>:

	(Credits : Theory – 03)
Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100	Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for Mid

Semester Examination (MSE):

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be very short answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1mark; >75 to <=80, 2 marks; >80Attd. <=85,3 marks; >85Attd. <=90,4marks; >90Attd, 5 marks.

COMPILER DESIGN

Unit-I Introduction to compilers: introduction, design of language, evolution of compilers, stages of compilation.

Unit-II Lexical analysis: Introduction, Alphabets and token in computer language, representation of tokensand regular expression, Token recognition and finite state automata, implementation, Error recovery

Unit-III Syntax Analysis: Introduction, context free grammar and structure of language, parse tree, abstract syntax tree, ambiguity

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Theory: 45 Lectures

Nilamber-Pitamber University, Medininagar

Unit-IV Top down parsing: Top down parsing by recursive descent, LL(1), First and Follow

Unit–IV Bottom up parsing: LR(0) parsing, SLR(1), general LR(1) parsing algorithm, LALR(1) generatortool (yacc)

Unit-V Run time storage organization: Introduction, scope and lifetime of variables, symbol table, storage allocation, static allocation, heap allocation, stack allocation, parameter passing mechanism

Unit-VI Semantic analysis: Attribute and Attribute grammar, Data type and type checking

Unit-VII Intermediate code generation: need for intermediate code, types of intermediate code, representation by graphical method, Three address code, quadruples, triples, indirect triples

Unit-VIII Optimization and Code generation: Data flow analysis using flow graph, Optimization of basic block, loops in flow graph, peephole optimization, issues in code generation, directed acyclic graph representation, code generation from intermediate code.

References

Compiler Design , K Muneeswaran , Oxford.

Compiler Principle, Technique and Tools, Aho, Sethi, Ullman, Pearson.

Introduction to Automata and Compiler Design, DasarthramaiyaK. , PHI.

III. COURE COURSE - [CCMCA303]:

(Credits: Theory-03)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for <u>Mid</u> Semester Examination (MSE):

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be very short answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

PHP, JAVA SCRIPT & JQUERRY PROGRAMMING Theory: 45 Lectures

Unit I PHP: Introduction, hardware and software requirements, benefits of PHP, Comments, Syntax, Variables, Constants, Commands, Scope of variable. Expressions, Operators, Conditional statement, Looping constructs, Casting, Dynamic linking. PHP functions, Including and Requiring files, PHP version

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CBCS Curriculum Nilamber-Pitamber University, Medininagar MCA Course compatibility, PHP objects. Numerically indexed and Associative arrays, Foreach loop, Array functions. Using printf –precision setting, string padding, using sprint;, Date and Time functions, File handling. MySql Database connectivity in Object Oriented manner. PHP configuration file, Error tracking and debugging.

Unit II Introduction to MySQL: MySQL basics, MySQL Architecture, Database design and terms, Data types, Functions, Accessing MySQL via command line, Indexes, Accessing MySQL via phpMyAdmin, Normalization, Relationship, Transactions, Backing up and restoring. Connecting to MySQL server, Checking for Errors, Closing the MySQL Server Connection

Accessing MySQL using PHP: Process, Connecting to MySQL database, Insert, update, Deleting a record, Displaying form, Querying database, Running program, Table operation-creation, description, drop; Operations on data- addition, retrieving, updating, deletion; Preventing hacking attempts, Using mysql procedurally.

Unit III Form handling: Building form, Retrieving submitted data, Various attributes in HTML5- auto complete, autofocus, placeholder, required, override, width and height, form, list, min and max, step; Colour input type, Number and range input types.

Cookies, Sessions and Authentication: Using cookies in PHP, HTTP authentication, Using sessions.

Unit IV Exploring JavaScript: , Introduction to JavaScript, ways to use JavaScript, Working with events, Clientside Validation, JavaScript and HTML text, Using comments, Semicolon, Variables, Operators, Variable typing, Functions, Global variables, Using DOM, Using console.log, Using alert, Writing into elements, Using documents. write, Expressions, Literals, Variables, Operators, The with statement, Using on error, Using try...catch, Conditional statements, Looping constructs, Explicit casting, Functions, Objects, Arrays.

Unit V JAVASCRIPT and PHP validation: Validating user input, Regular Expressions, Meta charactersand Fuzzy character matching, Parentheses grouping, Character class, Negation, General modifiers, Redisplaying form after validation.

Unit VII Introduction to JQUERY: JQuery, Syntax, Selectors, Handling events, validations, JQUERY Forms, Event functions and properties, Special effects, Manipulating DOM, Dynamically applying classes, Modifying dimensions, DOM traversal, Using Ajax, Plug-ins.

Reference Book:

Learning Php, Mysql& Java Script, Robin Nixon, O'reillyPHP Bible, (Author) Tim Converse, Joyce Park. Beginning PHP5(Author) David Mercer, Allan Kent, Steven Nowicki, Clark Morgan, Wankyu Choi

IV. CORE COURSE- [CCMCA304]:

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for Mid Semester Examination (MSE):

There will be two groups of questions in written examinations of 20 marks. Group A is compulsory and will containfive questions of very short answer type consisting of 1 mark each. Group B will contain descriptive type five questions of five marks each, out of which any three are to be answered.

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Director MCA Course, NPU Medininagar

(Credits: Theory-03)

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be very short answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

ANALYSIS & DESIGN OF ALGORITHM Theory: 45 Lectures

Unit – I Elementary Algorithmic & Asymptotic Notation: Problems and instances, The efficiency of algorithms, Average and worst-case analyses, Elementary operations. A notation for "the orderof",

other asymptotic notation, Conditional asymptotic notation, Asymptotic notation with several parameters, Asymptotic notation Operations.

Unit – II Algorithm Analysis: Control structures analysis, using a barometer, Supplementary examples, Average-case analysis, Amortized analysis, solving recurrences

Unit – III Greedy Algorithms: Greedy algorithm's characteristics, Graphs: Minimum spanning trees, Shortest paths, The knapsack problem, scheduling concepts.

Unit – IV Divide-and-conquer: Multiplying large integers, the general template, Binary search, Sorting, Finding the median, Matrix Multiplication, Exponentiation

Unit – V Dynamic Programming: Calculation of binomial coefficient, The World Series, Makingchange, the principle of optimality, the knapsack problem, shortest paths, chained matrix multiplication **Unit – VI**

Exploring Graphs: Graphs and games: An introduction, Traversing trees, Depth-first search: Undirected graphs, Depth-first search: directed graphs, Breadth-first search, Backtracking, Branchand-bound, the minimax principle.

Unit – VII Probabilistic Algorithms: Introduction, Probabilistic does not imply uncertain, Expected versus average time, Pseudorandom generation, Numerical probabilistic algorithms, Monte Carlo algorithms, Las Vegas algorithms.

Text Book:

G Brassard & P Bratley - Fundamentals of Algorithmics PHI, New Delhi, 2005

Reference Books:

E.Horowitz. et.al.- Fundamentals of Computer Algorithms, Galgotia Publication Pvt. Ltd., New. Delhi, 2004 J.Kleinberg& E. Tardos – Algorithm Design, Pearson Education, New Delhi, 2006

T.H. Cormen et.al. – Introduction to Algorithms – PHI, New Delhi, 2005

S. Dasgupta et.al. – Algorithm, TMH, New Delhi – 2007

S. Sahani – Data Structures, Algorithms and Applications in C++ 2nd Edition, Universities Press(India) Pvt. Ltd., 2005

V. <u>PROFESSIONALELECTIVE - I [PRMCA305]</u>:

(Credits: Theory-03)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for <u>Mid</u>

Semester Examination (MSE):

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will bevery short answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered. Note: There may be subdivisions in each question asked in TheoryExaminations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

(Attendance Upto75%, 1mark; 75<Attd.<80, 2 marks; 80<Attd.<85, 3 marks; 85<Attd.<90, 4 marks; 90<Attd, 5 marks).

NETWORK SECURITY AND CRYPTOGRAPHY Theory: 45 Lectures

Unit-I Attacks on Computers and Computer Security: Introduction, The Need for Security, Security Approaches, Principles of Security, Types of Attacks.

Unit-II Cryptography: Concepts and Techniques: Introduction, Plain Text and Cipher Text, Substitution Techniques, Transposition Techniques, Encryption and Decryption, Symmetric and Asymmetric Key Cryptography, Steganography, Key range and Key Size, Possible Types of Attacks.

Unit-III Symmetric Key Algorithms and AES: Introduction, Algorithm Types and Modes, An Overview of Symmetric Key Cryptography, Data Encryption Standard (DES), International Data Encryption Algorithm (IDEA), RC4, RC5, Blowfish, Advanced Encryption Standard (AES).

Unit-IV Asymmetric Key Algorithms, Digital Signatures and RSA: Introduction, Brief History of Asymmetric Key Cryptography, An Overview of Asymmetric Key Cryptography, The RSA Algorithm, Symmetric and Asymmetric Key Cryptography Together, Digital Signatures, Knapsack Algorithm, Some Other Algorithms.

Unit-V Digital Certificates and Public Key Infrastructure(PKI): Introduction, DigitalCertificates, Private Key Management, The PKIX Model, Public Key Cryptography Standards (PKCS), XML, PKI andSecurity, Creating Digital Certificates Using Java.

Unit-VI Internet Security Protocols: Introduction, Basic Concepts, Secure Socket Layer (SSL), Transport Layer Security (TLS), Secure Hyper Text Transfer Protocol (SHTTP), Time Stamping Protocol(TSP), Secure Electronic Transaction (SET), SSL versus SET, 3-D Secure Protocol, Electronic Money, Email Security, Wireless Application Protocol (WAP) Security in GSM, Security in 3G.

Unit-VII User Authentication and Kerberos: Introduction, Authentication Basics, Passwords, Authentication

Faculty MCA Course, NPU Medininagar

MCA Course CBCS Curriculum Nilamber-Pitamber University, Medininagar Tokens, Certificate-based Authentication, Kerberos, Key Distribution Center (KDC), Security Handshake Pitfalls, Single Sign on (SSO) Approaches.

Network Security, Firewalls and Virtual Private Networks (VPN): Introduction, Brief Introduction TCP/IP, Firewalls, IP Security, Virtual Private Networks (VPN), Intrusion.

Text Book:

A.Kahate- Cryptography and Network Security, 2ndEdn., Tata McGraw Hill Publication, New Delhi, 2007

Reference Books:

B.A. Foronzan – Cryptography & Network Security, TMH, New Delhi, 2007

S. Stalling - Cryptography and Network Security, Pearson Edn., New Delhi, 2006

VI. CORE COURSE- [CCMCA306]:

Pass Marks (SIA:17 + ESE:28)=45 Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Instruction to Question Setter for Mid

Semester Examination (MSE):

There will be two groups of questions in written examinations of 20 marks. Group A is compulsory and will contain five questions of very short answer type consisting of 1 mark each. Group B will contain descriptive type five questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will bevery short answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered. Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

(Attendance Upto75%, 1mark; 75<Attd.<80, 2 marks; 80<Attd.<85, 3 marks; 85<Attd.<90, 4 marks; 90<Attd, 5 marks).

COMPUTER GRAPHICS

Unit I:Basic raster graphics Algorithms for Drawing 2D primitives: Scan converting Lines, Circles, Elipses, Filling Rectangles, Polygons, Ellipse, Pattern filling, Clipping in Raster world-(Lines, Circles, Elipses, Polygons), Antialiasing.

Unit II: Graphics hardware and input devices: Hardcopy and display technologies, raster scandisplay systems, the video controller, random scan processor, input devices for operator interaction, image scanners.

Unit III: Input devices, interaction techniques and interaction tasks: interaction hardware, basicinteraction tasks, composite interaction tasks.

Unit IV: Geometrical transformation:2D transformations, homogeneous coordinates and matrixrepresentation of 2D transformation, composition of 2D transformation, the windows-to-view port transformation, efficiency.

Unit V:Matrix representation of 3D transformation, composition of 3D transformation, transformation as a change in coordinate system.

Unit VI:Viewing in 3D: Projections, specifying an arbitrary 3D view, examples of 3d viewing, the

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Director MCA Course, NPU Medininagar

Theory: 45 Lectures

(Credits: Theory-03)

Nilamber-Pitamber University, Medininagar

MCA Course mathematics of planar geometric projections, implementing planar geometric projection and coordinate systems.

Unit VII: Achromatic and coloured light: Achromatic light chromatic colour, colour models forraster graphics, reproducing colour, using colour in computer graphics.

Unit VIII: Visible-Surface Determination: Functions of Two Variables, Techniques for EfficientVisible-Surface Algorithms, Algorithms for Scan-Line Determination, The z-Buffer Algorithms, List-Priority Algorithms, Area-Subdivision Algorithms, Algorithms for Octress.

Unit IX: Clipping: 2-D Clipping algorithms- Line clipping algorithms such as Cohen Sutherland line clipping algorithm, Liang Barsky algorithm, Line clipping against non rectangular clip windows; Polygonclipping -Sutherland Hodgeman polygon clipping, Weiler and Atherton polygon clipping, Curve clipping, Text clipping

Text Books

D.Hearn and M.P.Baker, Computergraphics, Pretice-hall of india 2004

J.D.Foley, Avann Dam, S.K. Feiner and J.F. Hughes, computer graphics: principals and practices D.F.Rogerrs and A.J. Admas, mathematical elements in computer graphics.

VII. CORE COURSE- [CCMCA307]:

(Credits: Theory-03)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45 Instruction to Question Setter for Mid

Semester Examination (MSE):

There will be two groups of questions in written examinations of 20 marks. Group A is compulsory and will contain five questions of very short answer type consisting of 1 mark each. Group B will contain descriptive type five questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will bevery short answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered. There may be subdivisions in each question asked in Theory Examinations *Note:*

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

(Attendance Upto75%, 1mark; 75<Attd.<80, 2 marks; 80<Attd.<85, 3 marks; 85<Attd.<90, 4 marks; 90<Attd, 5 marks).

OPTIMIZATION TECHNIQUE

Objectives: The objective of this course is to understand the need and origin of the optimization methods and to get a broad picture of the various applications of optimization methods used in engineering. This course is indent for designing and controlling complex systems, solving hard problems of efficiently allocating scarce resources using in complete information, and developing sustainable strategies to master situations of conflict and co-operation using scientific methods and information technology.

Pre-requisites: Quantitative Analysis using C/C++, Design and Analysis of Algorithms and Probability & Statistics.

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Director MCA Course, NPU Medininagar

Theory: 45 Lectures

MCA Course Course Outcomes (CO):

CO1	Students will able to demonstrate knowledge and understanding of the basic ideas underlying optimization techniques.
CO2	Students will be able to use decomposition techniques to solve hard optimization problems.
CO3	Student can use mathematical approach to optimization problems relevant to computer application.

UNIT – I

Introduction to Operations Research [8 Hrs.]

Introduction to OR modelling approach and various real life situations, Linear programming problems and applications, Solving Linear Programming problem using simultaneous equations and Graphical Method, Simplex Method and extensions, Sensitivity analysis - Duality theory. Transportation model, Transhipment problems and Assignment problems.

Dynamic Programming [6 Hrs.]

Bellman's principle of optimality, Examples on the application on routing problem, Inventory problem, Simplex problem, Marketing problem.

Network Analysis [6 Hrs.]

PERT and CPM, Probability of achieving completion data, Cost analysis, Graph reduction theory, Updating, Resource allocation, Resource smoothing.

UNIT – II

Inventory Method [7 Hrs.]

Inventory problem, Variables in an inventory problem, Inventory models with penalty, Storage and Quantity discount, Safety stock, Inventory models with probability Demand, Multi-item deterministic model. Simulation, Types of simulation models, Applications of simulation for Inventory problems.

Queuing Theory [7 Hrs.]

Poison arrivals and Exponential service times, Waiting time and Idle time cost, Single channel and Multi-channel problem. Applications of simulation for Queuing problems. Monte Carlo technique applied to queuing problems, Poisson arrivals and service time.

Theory of Games [6 Hrs.]

Introduction – Minimax (maximin) – Criterion and optimal strategy – Solution of games with saddle points – Rectangular games without saddle points – 2X2 games, Examples on the application of theory of games. – Dominance principle – mX2 & 2Xn games - Graphical method and Linear programming method for different problems, Decision trees.

Text Books:

1. Hamdy A. Taha, Operations Research, Macmillan.

- 2. Kumar Gupta, Prem and Hira, D.S., Operations Research, S Chand.
- 3. Swarup, Kanti, Gupta, P.K. and Manmohan, Operations Research, Sultan Chand & Sons.

Reference Books:

- 1. Richard Bronson, Operations Research Schaum outline series, Tata McGraw Hill.
- 2. V.K. Kapoor-- Operations Research, S Chand & Sons.
- 3. Hiller F. and Leibermann G. J., Operation Research, Tata McGraw Hill.
- 4. Srinath L.S., PERT & CPM Principles and Applications, Affiliate East West Press(P).

VIII. PROFESSIONAL ELECTIVE - I [PRMCA308]:(Credits: Theory-03)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for <u>Mid</u> Semester Examination (MSE):

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will be veryshort answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

DATA WAREHOUSING AND DATA MINING

Theory: 45 Lectures

Unit –I Introduction : Data Warehousing Definition, Multidimensional Data Model, OLAP Operation, OLTP Operation, Warehouse Scheme, Data Warehousing Architecture, Metadata, OLAP ENGINE, Data warehouse Backend Process, OLAP Vs OLTP.

Unit –II Data Warehousing: Overview, Definition, Delivery Process, Multi-Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data Mining.

Unit –III Data Mining: Introduction, Data Mining Definition, Motivation behind Data mining, Why is it important, KDD Vs, Data Mining, Data Mining Functionalities, DBMS Vs DM, other related area, DM Technique, Other Mining Problem, Issue and challenges are in DM, DM Application area, DM Application, Case Study.

Unit-IV Classification and Prediction: - Issues Regarding Classification and Prediction, Classification by Decision Tree, Rule Based Classification, Classification by Back propagation, Support Vector Machines, Lazy Learners, Prediction, Accuracy and Error Measures, Evaluating the Accuracy of a Classifier or Predictor.

Unit –V Clustering Techniques: Introduction, Clustering Paradigram, Generalized, Partition Algorithm, K-Medoid Algorithm, K-Mean Algorithm, CLARA, CLARANS, DBSCAN, BIRCH, CURE, Categorical Clustering Algorithms, STIRR, ROCK, CACTUS.

Unit –VI Mining Association Rule in Large Database: Introduction, What is an Association Rule, Method to discover association Rule, A Priori Algorithm, Partition Algorithm, Linear-Search algorithm, Dynamic item set Counting Algorithm, FP Tree Growth?

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Unit–VII Decision Trees: Introductions, Tree Construction Principle, Best split splitting Indices, Splittingcriteria, Decision Tree Construction with Presenting, Prunesing Technique, Integration of Pruning Technique and Construction.

Text Book

A.K. Pujari, A Data Mining Technique, University Press (India) Limited, 2001

Reference Book

A Hand and M. Kamber, ?Data Mining Concept and Technique?, Morgan Kauffman Publishers,Else River India, New Delhi, 2003.

RecherdJ, Roiger and Michance W. Creatz, Data Mining: A tutorial Based Primer, Addision Wesley, 2003.

- I. M.H. Dienham, Data Mining: Introductory and Advanced Topics, Pentice Hall 2003.
- II. Alex Berson and Stephen J. Smith "Data Warehousing, Data Mining & OLAP", Tata McGraw –Hill Edition, Tenth Reprint 2007.

ARTIFICIAL INTELLIGENCE

Theory: 45 Lectures

Objectives: The objective of the course is to learn various areas of Artificial Intelligence, such as symbolic representation, knowledge representation, cognitive models, goal-based systems, heuristic search, games as environments, deductive systems and expert systems, vision; audition, language understanding etc. Rather than present AI as a loose collection of ideas and techniques, this course will strive to emphasize important unifying themes that occur throughout many areas of AI research.

Pre-requisites: Data Structures, Analysis and Design of Algorithms and Statistics.

Course Outcomes (CO):

CO1	Students will be able to develop an understanding of artificial
	intelligence and problem solving techniques.
CO2	Student will be able to draw inferences using the concepts of knowledge
	and reasoning.
CO3	Student will be able to understand and apply the concepts of expert
	system.

UNIT- I

Artificial Intelligence [4 hrs.]

Introduction, Intelligent agents: Agents and environments, the concept of rationality, Nature of environments, Structure of environments

Problem Solving [7 hrs.]

Solving Problems by Searching: Problem solving agents, Uninformed Search strategies, Avoiding repeated states, Informed Searches and exploration, Informed search strategies, Heuristic functions, Local search algorithms and optimization problems.

Adversarial searches [5 hrs.]

Games, Optimal decision in games, Alpha beta pruning, Imperfect real-time decisions

UNIT- II

Knowledge and Reasoning [7 hrs.]

Logical Agents: Knowledge based agents, Propositional logic, Resolution, Effective propositional inference, Agents based on propositional logic.

First-Order Logic [3 hrs.]

Syntax and semantics of First order logic, Using FOPL.

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Inference in First-Order Logic [4 hrs.]

Unification, Forward chaining, Backward chaining, Resolution.

Learning [5 hrs.]

Learning from Observations: Form of learning, Inductive learning, Learning decision tree, Ensemble learning, Computational learning theory.

Expert Systems [5 hrs.]

Introduction (characteristic features of expert systems, Background History, Applications, importance of expert systems); Rule based system architectures (the knowledge base, the inference process, explaining how or why, building a knowledge base, the I/O interface).

Text Books:

1. S. Russel, & P Norvig, Artificial Intelligence A Modern Approach, Pearson Education.

2. Nills J Nillson, Artificial Intelligence A new Synthesis, Morgan Kauffman

Reference Books:

- 1. Luger, Artificial Intelligence, Pearson education.
- 2. Charnials Engine, Introduction to artificial intelligence, Wesley.
- 3. Petterson, Introduction to artificial intelligence and expert systems, PHI.
- 4. Padhy, N.P., Artificial intelligence and intelligence system, Oxford University Press.

IX. LANGUAGE ELECTIVE - II LAB [EPMCA309]:

(Credits:Practical-02)

Marks: 30 (SIA: 20 Exp. + 10 Viva) + 70 (ESE Pr: 6Hrs)=100	Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for

Semester Internal Assessment (SIA):

There will be **two** questions in Practical Examination of 3Hrs.out of which **any one** is to be answered. The questions in ractical examination will be of equal to 20 marks and will be so framed that the students are able to answer themwithin the stipulated time. 10 marks will be awarded on the performance in viva voce.

End Semester Practical Examination (ESE Pr):

Lab: There will be **four** questions in Practical Examination of 3Hrs.out of which **any two** are to be answered. Student haveto Answer the given questions on Answer booklet and execute the answered programs/steps in computer with standard output. The questions in practical examination will be of equal to 50 marks and will be so framed that the students are able to answer them within the stipulated time. 10 marks will be awarded on the performance in viva voce whereas 10 marks will be awarded on cumulative assessment which is further subdivided as 5 marks for Practical record and 5 marks for Attendance.

Assignment: The Assignment should be hand written (preferred)/ typed in A4 size paper. First three pages (i.e. front page+ acknowledgment + index) & Bibliography may be printout. <u>No Xerox copy is allowed.</u> **Marks Distribution**:

LAB(Experiment + Answer script)	= 50 marks
Assignment/ Project + Attendance	=10 marks
Viva-voce	=10 marks
Note:	

Attendance Upto75%, 1 mark; >75 to <=80, 2 marks; >80Attd.<=85, 3 marks; >85Attd.<=90, 4 marks; >90 Attd, 5 marks.

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ADVANCE JAVA PROGRAMMING LAB

Practical: 30 Hours

- 1. Programming with the Java Tools Javaap, Jcmd, Jhat, Jdb, Jar
- 2. Java API Components AWT to create Components, Containers- window, frame, dialog, panel.
- 3. Swing J components Class, Dialog boxes, Panels, Labels, Checkboxes, Menus, Toolbars and Actions, Sliders, Spinners, Progress bars, Scrollbars, List and Combo boxes,
- 4. Text-entry Components,
- 5. Colour and File Choosers,
- 6. Tables and Trees, Printing with 2D API, Java Print Service API.
- 7. JDBC Drivers for RDBMS, SQL to Java type Mapping, Use of java.sql
- 8. XML structure, XML example document, Node interface, Document Node Methods, Element Node properties, Text Nodes. Parsing an XML Document with DOM tree, Generating an XML document with DOM, Validating XML Documents using DTD and XML schema, Transforming XML using XSLT.
- 9. Introduction, Working with URL connections, URL encoders and decoders.
- 10. Application Packaging, Servlets, The Servlet API, The User Experience, Building a Web App with Continuity, Framework for Building Web Applications, Building Robust Web Apps.
- 11. Developing a simple Bean, create a source file for the new Bean, Create an instance of the colourBean, Bean interfaces, Message Driven Beans, EJB-Based Application.

Reference Books:

Wigglesworth & McMillan – JavaTM Programming Advanced Topics, 3rdEdn., India Edition, Thomson Education, New Delhi, 2007

Uttam K. Roy- Advanced Java Programming, Oxford University Press, 2015

Herbert Schildt The Complete Reference Java 2, 4thEdn, TMH.

X. PRACTICAL'S ON CORE- [CCMCA310]:

Marks: 30 (SIA: 20 Exp. + 10 Viva) + 70 (ESE Pr: 6Hrs)=100

Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for

Semester Internal Assessment (SIA):

There will be **two** questions in Practical Examination of 3Hrs.out of which **any one** is to be answered. The questions in practical examination will be of equal to 20 marks and will be so framed that the students are able to answer them within the stipulated time. 10 marks will be awarded on the performance in viva voce.

End Semester Practical Examination (ESE Pr):

Lab: There will be *four* questions in Practical Examination of 3Hrs.out of which **any two** are to be answered. Students

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CBCS Curriculum have to Answer the given questions on Answer booklet and execute the answered programs/steps in computer with standard output.

The questions in practical examination will be of equal to 50 marks and will be so framed that the students are able to answer them within the stipulated time. 10 marks will be awarded on the performance in viva voce whereas 10 marks will be awarded on cumulative assessment which is further subdivided as 5 marks for Practical record and 5 marks for Attendance.

Assignment: The Assignment should be hand written (preferred)/ typed in A4 size paper. First three pages (i.e. front page + acknowledgment + index) & Bibliography may be printout. <u>No Xerox copy is allowed.</u>

Marks Distribution:

LAB(*Experiment* +*Answer script*) = 50 marksAssignment/ Project+Attendance =10marks Viva-voce =10marks

Note:

(Attendance Upto75%, 1mark; 75<Attd.<80, 2 marks; 80<Attd.<85, 3 marks; 85<Attd.<90, 4 marks; 90<Attd, 5 marks)...

PHP, JAVA SCRIPT & JQUERY PROGRAMMING LAB

Practical: 30 Hours

Programs to develop to do the following:-

PHP: 1. Syntax to declare Variables, Constants, Scope of variables.

- 2. Expressions, Operators, Conditional statement, Looping constructs, Casting,
- 3. Dynamic linking.
- 4. PHP functions, Including and Requiring files, Date and Time functions
- 5. PHP objects.
- 6. Numerically indexed and Associative arrays, Foreach loop, Array functions.
- 7. File handling.

MySQL:

- 1. Data types, Functions,
- 2. Accessing MySQL via command line,
- 3. Indexes,
- 4. Accessing MySQL via php My Admin,

5. Connecting to MySQL database: Displaying form, Querying database, Tableoperationcreation, drop.

6. Operations on data- addition, retrieving, updating, deletion;

FORM HANDLING:

- 1. Building form, retrieving submitted data,
- 2. Various attributes in HTML5- autocomplete, autofocus, placeholder, required, override, Width and height, form, list, min and max, step;
- 3. Colour input type, Number and range input types.

COOKIES, SESSIONS AND AUTHENTICATION:

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Using Cookies in PHP-Setting a Cookie, Accessing a Cookie, Destroying a Cookie, HTTP authentication, --Storing Usernames and Passwords, alting,Using sessions— Starting a Session, Ending a Session, Session Security

EXPLORING JAVASCRIPT:

- 1. JavaScript and HTML text,
- 2. Declaring Variables, Operators, Variable typing,
- 3. Functions, Global variables, Using DOM, Using console.log, Using alert,
- 4. Writing into elements, Using documents. write,
- 5. Expressions, Literals, Variables, Operators,
- 6. The with statement,
- 7. Exception handling Using on error, Using try...catch,
- 8. Conditional statements, Looping constructs, Explicit casting, Functions, Objects, Arrays.

JAVASCRIPT AND PHP VALIDATION:

Validating User Input with JavaScript--The validate.html Document (Part One) , The validate.html Document (Part Two), Regular Expressions— Matching Through Meta characters, Fuzzy Character Matching, Meta characters, Grouping Through Parentheses, Character class, Negation, General modifiers, Redisplaying form after validation.

ACCESSING CSS FROM JAVASCRIPT:

Revisiting the get Element By Id function— The O Function, The S Function, The C Function, Accessing CSS properties from JavaScript--- Some Common Properties, other Properties

Inline JavaScript—

Some Common Properties, Attaching Events to Objects in a Script, Attaching to Other Events, Adding new element— Removing Elements,

Alternatives to Adding and Removing ElementsUsing

interrupts----

Using set Timeout, Canceling a Timeout, Using set Interval, Using Interrupts for Animation

JQUERY:

JQuery, Syntax, Selectors, Handling events, Event functions and properties, Special effects, Manipulating DOM, Dynamically applying classes, Modifying dimensions, DOM traversal, Using Ajax, Plug-ins.

Reference Books:

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XI. PRACTICAL'S ON CORE – [CPMCA311]:

(Credits: Practical-02)

Marks: 30 (SIA: 20Th. 1Hr + 5Attd. + 5Assign.) + 70 (ESE: 3Hrs)=100 Pass Marks (SIA:17 + ESE:28)=45

Instruction to Question Setter for <u>Mid</u> <u>Semester Examination (MSE):</u>

There will be **two** groups of questions in written examinations of 20 marks. **Group A is compulsory** and will containfive questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type five** questions of five marks each, out of which any three are to be answered.

End Semester Examination (ESE):

There will be two groups of questions. Group A is compulsory and will contain two questions. Question No.1 will bevery short answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to be answered.

Note: There may be subdivisions in each question asked in Theory Examinations

The Mid Semester Examination shall have three components. (a) Two Semester Internal Assessment Test (SIA) of 20 Marks each, (b) Class Attendance Score (CAS) of 5 marks and (c) Class Performance Score (CPS) of 5 marks. "Best of Two" system will be applicable for marking for SIA.

(Attendance Upto75%, 1mark; 75<Attd.<80, 2 marks; 80<Attd.<85, 3 marks; 85<Attd.<90, 4 marks; 90<Attd, 5 marks).

LAB ON COMPUTER GRAPHICS

Practical: 30 Hours

Write a programme for the following in (C/C++/ JAVA)

- 12. For locating point
- 13. For drawing line
- 14. Implement Breshnham algorithm for line drawing.
- 15. Implement dda algorithm for line drawing.
- 16. Circle drawing.
- 17. Elipse drawing
- 18. Parabola drawing.
- 19. Boundary fill algorithm.
- 20. Tranformation in 2d
- 10.Rectangle 11.Bar

and 3D Bar 12.Arc

etc.

Reference:

V.K. Pachghare, Comprhensive Computer Graphics, Laxmi Publication.

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SEMESTER IV

2 Papers

Total = (50 Marks) + (200 Marks) = 250Marks

I. <u>PRACTICAL'S ON CORE – [PRMCA401]</u>:

PRE SUBMISSION SEMINAR

This paper is meant for realising all basic and advanced concepts studied so far by providing software enabled solution on the topic or situation or real problem and become confident enough to overcome challenges of Software industries.

Every student will have to do Mini Project by selecting any topic of his choice under the supervision of internal guide/teacher and to present a report for evaluation prior to the End Semester University Examination. The distribution of marks will be as given above:

Selection of Internal Guide:

The student has to approach to faculty members for his/her consent for internal guide.

Instruction to the guide:

Each faculty member will give consent for internal guide to a maximum no. of candidates as per following condition:

Maximum No. of candidates/Faculty member = Total No. of Students/ Total No. of Faculty members.

II. PRACTICAL'S ON CORE – [CPMCA402]:

(Credits : 06)

Marks : 50(Documentation) + 50 (Design) + 50 (Coding) + 25 Presentation + 25 (Viva) =200

Guidelines to Examiners for End Semester Examination (ESE):

Overall project dissertation may be evaluated under the following heads:

- Motivation for the choice of topic
- Project dissertation design
- Methodology and Content depth
- Results and Discussion
- Future Scope & References
- Participation in Field Training Programme
- Application of Research technique in Data collection
- Report Presentation
- Presentation style
- Viva-voce

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FINAL PROJECT AND INTERNSHIP

A. ON JOB TRAINING (OJT):

- 1. OJT is **ON JOB TRANING**, Student have to do two months (**OJT Six Month**) industrial Training from IT origination (**Reference letter for OJT of must be issued from Concern Department**). Student has to produce daily report. In this daily report, Attendee sheet, Work culture and working hour list, day by day, must be listed.
- 2. **Project Dissertation** approved by the Subject Teacher/H.O.D. of the Department/College concerned. The progress of the Project Dissertation shall be monitored by the faculty members at regular intervals.

Academic Credits for training shall be based on following:

A **Power Point presentation** (based on the report) for duration of **10 minutes** should be make. This will be presented in front of examiners. Marks will be awarded on this presentation and documents submitted to the faculty coordinator at the institute.

Students have to submit the following on completion of training to the concern faculty at the college:

- 1. Synopsis submission
- 2. Synopsis Approval will be given within a week from the date of submission.
- 3. Synopsis will be approved by concerned department faculty member.
- 4. Faculty members will be the internal guide of particular group of Students.
- 5. Group will present power point presentation in front of panel and submit the project status report within the 15 to 20 days from the date of approval.
- 7. Final Project Submission contains Hard copy, Soft copy & leaveletter. <u>Project hard copy contains</u>
 - a) Front page
 - b) Certificate of Authenticity
 - c) Certificate of job Training
 - d) Declaration
 - e) Acknowledgement
 - f) Table of content/index
 - g) Project guidelines (These points are mandatory)
 - (i). Introduction with Company profile.
 - (ii). Vision, mission & objective.
 - (iii). SWOT Analysis.
 - (iv). Chronology of Achievements.
 - (v). Topic introduction & discussion.
 - (vi). Its relevance & implication in company.
 - (vii). Findings.
 - (viii). Conclusion
 - (ix). Further enhancement (Suggestion).
 - (x). Bibliography
 - (xi). Reference Website
 - (xii). CD (compact Disc)
 - h) The file should be Book Binding .One Project Report for office copy and each candidate must have its own copy.
- 8. Leave Card.

The Training Report will be submitted in the form specified as under:

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- a. The typing should be done on both sides of the paper(instead of single side printing)
- b. The font size should be12 with Times New Roman font.
- c. The Training Report may be typed in 1.5 line spacing.
- d. The paper should be A-4size.

Two copies meant for the purpose of evaluation may be bound in paper and submitted to the approved authority.

DISTRIBUTION OF MARKS FOR EXAMINATIONS AND FORMAT OF QUESTION PAPERS

Distribution of Marks for Mid Semester Evaluation:

Table No. 15: Distribution of marks of Theory Examinations of Mid Semester

		Code Full Marks	Pass Marks Tim		Group-A (Very short answer type	Group-B (Descriptive	Total No. of Questions to Set	
Торіс	pic Code			Time	Compulsory Questions) No. of Questions x Marks = F.M.	Questions) No. of Questions x Marks = F.M.	Group A	Group B
Mid Sem*	T30*	30 (20 +5 +5)	15	1 Hr	5 x1 =5	3 (out of 5) x5 =15	05	5

*There shall be 20 marks theory examination for mid sem, 05 marks for attendance/ regular interactions& 05 marks for seminar/ assignment/ term paper given by faculty concerned in classrooms.

Distribution of Marks for End Semester Theory Examinations:

Table No. 16: Marks distribution of Theory Examinations of End Semester

Tonia	Cada	Evil Mosks	Evel Marke Pass Time Compulsion Outsting) Group-A [#] Group-B (Descriptive Questions)		Total No. of Questions to Set			
Topic		Full Marks	Marks	Time	No. of Questions x Marks = F.M.	No. of Questions x Marks = F.M.	Group A [#]	Group B
End	T50	50	20	3 Hrs	2 x5 =10	2 (out of 3) x20 =40	2	3
Sem	T70	70	28	3 Hrs	Q.No.1 (5x1) + 1x5 =10	4 (out of 6) x15 =60	2	6

Question No.1 in Group-A carries very short answer type questions of 1 Mark

Note : There may be subdivisions in each question asked in Theory Examinations.

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i.

ii.

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FORMAT OF QUESTION PAPER FOR MID SEM EXAMINATION

20 MARKS MidSem No. ExamYear Subject/ Code Time:1Hr. **F.M.:** 20 **General Instructions:** Group A carries very short answer type compulsory questions. Answer 3 out of 5 subjective/ descriptive questions given in Group B.

iii. Answer in your own words as far as practicable.

Answer all sub parts of a question at one place. iv.

Numbers in right indicate full marks of the question. v.

Group - 'A'

1.		[5 x 1 = 5]
	i	
	ii	
	iii	
	iv	
	v	
	Group – 'B'	
2.		[5]
3.		[5]
4.		[5]
5.		[5]
6.		[5]

Note: There may be subdivisions in each question asked in Theory Examination

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FORMAT OF QUESTION PAPER FOR MID SEM EXAMINATION

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70 MARKS MidSem No. ExamYear Subject/ Code **F.M.: 7**0 Pass Marks: 28 Time: 3 Hrs. **General Instructions:** i. Group A carries very short answer type compulsory questions. ii. Answer 5 out of 7subjective/ descriptive questions given in Group B. iii. Answer in your own words as far as practicable. iv. Answer all sub parts of a question at one place. Numbers in right indicate full marks of the question. v. Group - 'A' 1. [5 x 1 = 5]i.

	ii	
	iii	
	iv	
	V	
2.		[5 x 3 =15]
	Group – 'B'	
3.		[10]
4.		[10]
5.		[10]
6.		[10]
7.		[10]
8.		[10]

Note: There may be subdivisions in each question asked in Theory Examination.