AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
Gudur, Nellore Dist - 524101, A.P (India)

ACADEMIC REGULATIONS FOR THE AWARD OF FULL TIME
M.C.A. DEGREE PROGRAMME
(WITH EFFECT FROM THE ACADEMIC YEAR 2013-14)

Audisankara College of Engineering and Technology, Gudur, Nellore District, Andhra Pradesh shall confer M.C.A Post Graduate degree to candidates who are admitted to the Master of Computer Applications Programme and fulfilled all the requirements for the award of the degree.

1. ELIGIBILITY FOR ADMISSIONS:-

Admission to the Master of Computer Applications programme shall be made subject to the eligibility, qualifications and specialization criteria prescribed by the JNTUA, Anantapur from time to time.

- As per the norms of A.P. State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made into the first year of three year M.C.A. P.G. Degree Programme as follows:-
  - As per the norms of Government of Andhra Pradesh, Category-A (based on the rank obtained in ICET) seats will be filled up by the Convener, ICET.
  - As per the norms of Government of Andhra Pradesh, Category-B seats will be filled up by the management.

2. COURSE WORK:-

- A Candidate after securing admission must pursue the M.C.A course of study for spread over Six Semesters duration.
- Each semester shall be of 20 weeks duration including all examinations.
- A candidate admitted into the programme should complete it within a period equal to twice the prescribed duration of the programme from the date of admission.

3.0 ATTENDANCE REGULATIONS AND CONDONATION:-

(i) A student shall be eligible to appear for end semester examinations, if he acquires a minimum of 75% attendance in aggregate of all the subjects.

(ii) Condonation of shortage of attendance in aggregate up to 10% on medical grounds (65% above and below 75%) in each semester may be granted on the recommendation of the College Academic Committee. However, granting condonation is purely at the discretion of Principal of the college.

(iii) A Student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester as applicable. They may seek re-admission for that semester as and when offered next.

(iv) Shortage of Attendance below 65% in aggregate shall in no case be condoned.

(v) Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examinations of that particular semester and their registration for examination shall stand cancelled.

(vi) A stipulated fee shall be payable towards condonation of shortage of attendance if granted.

(vii) Attendance may also be condoned for those students who participate in prestigious sports and co and extracurricular activities provided their attendance is in the minimum prescribed range for the purpose and recommended by the concerned authority.

4.0. EVALUATION:-

The performance of the candidate in each semester shall be evaluated subject-wise for a maximum of 100 marks for Theory and 100 marks for practical subjects, on the basis of Internal Evaluation and End Semester Examination. For the theory & practical subjects 60% of the marks will be for the External End Examination, while 40% of the marks for Internal Evaluation.

4.1 INTERNAL EVALUATION FOR THEORY SUBJECTS:

Each course is evaluated for **40** marks **(a+b)**

a) Two Midterm Examinations each for **30 marks** with a duration of two hours each will be conducted for every theory course in a semester. First Midterm Examination is conducted in the middle of the Semester (I & II units) and second Midterm Examination immediately after the completion of instruction (III & IV units) as per academic schedule. The Midterm Examination marks shall be awarded giving a weightage of 80% in the Midterm Examination in which the student scores more marks and 20% in the remaining Midterm Examination.

Midterm Examination Pattern for 30 Marks:

- Each Midterm Examination Question Paper comprises of four questions covering the two units.
- Answering any three questions.
- Questions 1 & 2 from one unit and Questions 3 & 4 from another unit. Each question is allotted 10 marks.

b) 10 marks are allocated for **Assignment Tests.**

- There will be four Assignment tests per subject in year/semester pattern.
- One Assignment test is conducted from each unit.
- Five Assignment questions are given in advance from each unit out of which two questions given by the concerned teacher has to be answered during Assignment test.
- Average of Assignment tests marks is considered.

NOTE: A student who is absent for any Midterm Examination / Assignment Test, for any reason whatsoever, shall be deemed to have scored zero marks in that Midterm Examination/ Assignment Test and no make-up test shall be conducted.

4.2 INTERNAL EVALUATION FOR PRACTICAL SUBJECTS:

For Laboratory courses there shall be continuous evaluation during the semester for 40 internal marks. The break-up of internal marks to be awarded is as given below:

Table 1: Break-up of Internal Marks

S.No.	Criterion	Marks
1	Conduct of experiments, Observation & Results in regular class work(Day-to-Day Performance)	25
2	Viva – voce and Internal Examination	15

In any semester a minimum of 90% of the prescribed number of experiments/exercises specified in the syllabus for laboratory course shall be conducted. They shall complete these experiments/exercises in all respects and submit report and get it certified by the concerned internal lab teacher and the Head of the Department to become eligible to appear for the final end examination in the Laboratory Course.

4.3 INTERNAL EVALUATION FOR SEMINAR-I & SEMINAR-II:

Two Seminars are to be conducted in the course consisting of Seminar–I and Seminar-II. Each of these two Seminars is to be conducted one in a particular semester. The distribution of internal marks for seminar is given below:

Table 2: Distribution of Marks

S.No.	Criterion	Marks
1	Seminar Report & Subject content	40
2	Seminar presentation & Viva – Voce Exam	60

There shall be two seminars one in the MCA III Semester and the other in the MCA V Semester. For the seminar, the student shall collect the information on a specialized relevant topic and prepare a report, showing his understanding over the topic, and submit to the department, which shall be evaluated by the Department Committee consisting of Head of the department, Seminar Supervisor and a Senior Faculty Member. Each Seminar shall be evaluated for 100 marks with a break up of 20 marks for report, 20 for subject content, 40 for presentation and 20 for queries.

4.4 A candidate shall be deemed to have secured the minimum academic requirement in a subject if he secures a minimum of 40% of marks in the End Examination and a minimum aggregate of 50% of the total marks in the End Semester Examination and Internal Evaluation taken together.

4.5 In case the candidate does not secure the minimum academic requirement in any subject(as specified in 4.4) he has to reappear for the Semester Examination either supplementary or regular in that subject, or repeat the course when next offered or do any other specified subject as may be required.

5.0 EVALUATION OF QUALITATIVE AND QUANTITATIVE ANALYSIS:-

The subject **Qualitative and Quantitative Analysis** is introduced in to the M.C.A Programme to equip with the necessary skill sets and to enhance the placement opportunities of students. It is a theoretical subject equivalent to any other professional theory subject but only internal evaluation.

6.0 SEMESTER END EXAMINATIONS:-

6.1 Theory Courses: 60 marks each

The Semester end examination in each theory subject shall be conducted for 3 hours duration at the end of the semester for 60 marks. The question paper shall be designed as per the following guidelines:

Question paper contains

- A total of Eight questions.
- Answer one Question from each Unit
- The Eight questions are to be designed taking one question from each unit (Unit Wise Either or Type) of the four units.

- In each question, one, two or more bits can be set, totaling 15 Marks with appropriate distribution of marks.

A student has to secure not less than a minimum of 40% of marks (24 marks) exclusively at the end semester examinations in each of the theory subjects in which the candidate had appeared. However, the candidate shall have to secure a minimum of 50% of marks (50 marks) in both external and internal components put together to become eligible for passing in the subject.

6.2 Lab Courses (Practical / Workshop): 60 marks

Out of 60 marks **40** marks are allocated for experiment (procedure for conducting the experiment carries 10 marks & readings, calculation and result-30) and **15** marks for viva-voce examination with **5** marks for the record.

Each Semester End Lab Examination shall be evaluated by an Internal Examiner along with an External Examiner. External Examiner is appointed by the Principal.
A candidate shall be declared to have passed in individual lab course if he secures a minimum of 50% aggregate marks (50 marks) (Internal & Semester External Examination marks put together), subject to a minimum of 40% marks (24 marks) in the semester external examination.

6.3 <u>EVALUATION OF PROJECT WORK:-</u>

Every candidate shall be required to submit thesis or dissertation after taking up a topic approved by the college/ concerned department.

- **Registration of Project work**: A candidate is permitted to register for the project work after satisfying the attendance requirement of all the courses (theory and practical courses of I to V Semesters)
- An Internal Departmental Committee (I.D.C) consisting of HOD, Supervisor/ Guide and one Internal senior expert shall monitor the progress of the project work.
- The work on the project shall be initiated in the penultimate semester and continued in the final semester. The candidate can submit Project thesis with the approval of I.D.C. at the end of the VI semester Instruction as per the schedule. Extension of time within the total permissible limit for completing the programme is to be obtained from the Head of the Institution.
- The student must submit status report at least in two different phases during the project work period. These reports must be approved by the I.D.C before submission of the Project Report.
- The viva-voce examination may be conducted as per the VI semester examination schedule.
- Three copies of the Thesis / Dissertation certified in the prescribed form by the supervisor and HOD shall be submitted to the HOD.
- The semester end examination for project work done during VI Semester, shall be conducted by a Project Review Committee (PRC). The evaluation of project work shall be conducted at the end of the VI Semester.
- The PRC comprises of an External examiner appointed by the Principal, Head of the Department and Project Guide/Supervisor to adjudicate the thesis / dissertation. The PRC shall jointly evaluate candidates work and award grades as given below

S.No	Description	Grade
1	Very Good	Grade A
2	Good	Grade B
3	Satisfactory	Grade C
4	Not satisfactory	Grade D

If the report of the viva-voce is not satisfactory (Grade D) the candidate will retake the viva-voce examination after three months. If he fails to get a satisfactory report at the second viva-voce examination he will not be eligible for the award of the degree unless the candidate is permitted to revise and resubmit the thesis.

7.0 RE-REGISTRATION FOR IMPROVEMENT OF INTERNAL EVALUATION MARKS:-

Following are the conditions to avail the benefit of improvement of internal evaluation marks.

- The candidate should have completed the course work and obtained examinations results for all six semesters pending submission of project work.
- He should have passed all the subjects for which the internal evaluation marks secured are more than 50%.
- Out of the subjects the candidate has failed in the examination due to Internal evaluation marks secured being less than 50%, the candidate shall be given one more chance for each Theory subject and for a maximum of **three** Theory subjects for Improvement of Internal evaluation marks.
- The candidate has to re-register for the subjects so chosen and fulfill all the academic requirements.
- For each subject, the candidate has to pay a fee equivalent to one third of the semester tuition fee and the amount is to be remitted in the form of D.D. in favour of **'The Principal, Audisankara College of Engineering & Technology' payable at Gudur** along with the requisition through the Controller of the Examinations of the college.
- In the event of availing the Improvement of Internal evaluation marks, the internal evaluation marks as well as the End Examinations marks secured in the previous attempt(s) for the reregistered subjects stand cancelled.

8.0 SEMESTER – WISE DISTRIBUTION OF CREDITS:-

Table 3: Semester –wise Credits distribution

SEMESTER	No. of Credits per semester Theory + Lab	Total credits
I Semester	20+06	26
II Semester	20+06	26
III Semester	22+04	26
IV Semester	22+04	26
V Semester	20+06	26
VI Semester	0+16	16
TOTAL CREDITS	104+42	146

9.0 AWARD OF DEGREE AND CLASS:-

A candidate shall be eligible for the award of degree if he satisfies the minimum academic requirements in every subject, Seminar and secures 'satisfactory' or higher grade report on his thesis/dissertation and viva-voce. Based on overall percentage of marks obtained, the following class is awarded.

Table 4: Award of Division

Class Awarded	% of marks to be secured
First Class with Distinction	70% and above
First Class	Below 70% but not less than 60%
Second Class	Below 60% but not less than 50%

10.0 READMISSION CRITERIA:-

A Candidate, who is detained in a semester due to lack of attendance, has to obtain written permission from the Principal for readmission into the same semester after duly fulfilling all the required norms stipulated by the college in addition to paying the required fee.

11.0. SUPPLEMENTARY EXAMINATIONS:-

Apart from the regular End Examinations the institute may also schedule and conduct supplementary examinations for all subjects for the benefit of students with backlogs. Such students writing supplementary examinations as supplementary candidates may have to write more than one examination per day.

12.0. CONDUCT AND DISCIPLINE:-

(a) Students shall conduct themselves within and outside the premises of the Institute in a descent and dignified manner befitting the students of ACET.

(b) As per the order of the Honorable Supreme Court of India, ragging in any form is considered a criminal offence and is totally banned. Any form of ragging will be severely dealt with.

(c) The following acts of omission and / or commission shall constitute gross violation of the code of conduct and are liable to invoke disciplinary measures with regard to ragging.
   (i) Lack of courtesy and decorum; indecent behavior anywhere within or outside the college campus.
   (ii) Damage of college property or distribution of alcoholic drinks or any kind of narcotics to fellow students / citizens.

(d) Possession, consumption or distribution of alcoholic drinks or any kind of narcotics or hallucinogenic drugs.

(e) Mutilation or unauthorized possession of library books.

(f) Noisy and unruly behavior, disturbing studies of fellow students.

(g) Hacking in computer systems (such as entering into other person's areas without prior permission, manipulation and / or damage of computer hardware and software or any other cyber crime etc.

(h) Usage of camera /cell phones in the campus.

(i) Plagiarism of any nature.

(j) Any other act of gross indiscipline as decided by the college academic council from time to time.

(k) Commensurate with the gravity of offense, the punishment may be reprimand, fine, expulsion from the institute/ hostel, debarring from examination, disallowing the use of certain facilities of the Institute, rustication for a specified period or even outright expulsion from the Institute, or even handing over the case to appropriate law enforcement authorities or the judiciary, as required by the circumstances.

(l) For an offence committed in (i) a hostel (ii) a department or in a class room and (iii) elsewhere, the chief Warden, the concern Head of the Department and the Principal respectively, shall have the authority to reprimand or impose fine.

(m) Cases of adoption of unfair means and/ or any malpractice in an examination shall be reported to the principal for taking appropriate corrective action.

(n) All cases of serious offence, possibly requiring punishment other than reprimand, shall be reported to the Academic council of the college.

(o) The Institute Level Standing Disciplinary Action Committee constituted by the academic council shall be the authority to investigate the details of the offence, and recommend disciplinary action based on the nature and extent of the offence committed.

(p) The Principal shall deal with any problem, which is not covered under these rules and regulations.

(q) **"Grievance and Redressal Committee" (General)** constituted by the Principal shall deal with all grievances pertaining to the academic / administrative / disciplinary matters.

(r) All the students must abide by the code and conduct rules prescribed by the college from time to time.

13.0 WITH – HOLDING OF RESULTS:-

If the candidate has not paid dues to the university/college or if any case of in-discipline is pending against him, the result of the candidate shall be withheld and he will not be allowed / promoted to the next higher semester. The issuing of degree is liable to be withheld in such cases.

14.0 TRANSITORY REGULATIONS:-

Candidates who have discontinued or have been detained for want of attendance or who have failed after having undergone the course in earlier regulations and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when such subjects are offered, subject to the conditions of 4.5 and 2.3 sections.

15.0 MINIMUM INSTRUCTION DAYS:-

The minimum instruction days for each semester shall be 90 clear instruction days excluding the days allotted for tests/examinations and preparation holidays declared if any.

16.0 AMENDMENTS OF REGULATIONS:-

The college may, from time to time, revise, amend or change the regulations, scheme of examinations and syllabi. However the academic regulations of any student will be same throughout the course of study in which the student has been admitted.

17.0 GENERAL:-

- The academic regulations should be read as a whole for the purpose of any interpretation.
- Disciplinary action for Malpractice/improper conduct in examinations is appended.
- Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".
- In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Head of the Institute is final.

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RULES FOR DISCIPLINARY ACTION FOR MALPRACTICE / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper conduct	**Punishment**
	If the candidate	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Is found copying in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate will be cancelled.
3.	Comes in alcohol drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
4.	Smuggles the Answer book or a part there of additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of

		seat.
5.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
6.	Possesses any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate will also be debarred and forfeit the seat.
7.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate will also be debarred and forfeit the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate will also be debarred for two consecutive semesters from class work and all end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the impostor is an outsider, he will be handed over to the police and a case registered against him.
8.	Refuses to obey the orders of the Chief Superintendent/Asst.Superintendent/ any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall causing any injury to him or to any of his relations	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are

	whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case registered against them.
9.	Is a student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clauses 6 to 8.	In case of students of the college expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
11.	Is detected copying on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	Indulging in any malpractice which is not covered in the above clauses 1 to 11 if detected shall be reported to the College Authorities for further action to award suitable punishment.	Appropriate action will be taken as recommended by the College Authorities.

Malpractices identified by squad or special invigilators

1. Punishments to the candidates as per the above guidelines.

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Course Structure for MCA Regular Programme
Applicable for students admitted from Academic Year 2013-14

MCA I Semester

Sl.No	Course Code	Subject	Scheme of instruction (Periods / week)		Scheme of Examination			No. of Credits
			Th	Lab	IM	EM	Total Marks	
1	13MC101	Problem Solving and "C" Programming	4	-	40	60	100	4
2	13MC102	Computer Organization	4	-	40	60	100	4
3	13MC103	Discrete Structures and Graph Theory	4	-	40	60	100	4
4	13MC104	Probability and Statistics	4	-	40	60	100	4
5	13MC105	Accounting and Financial Management	4	-	40	60	100	4
6	13MC106	Computer Organization Lab	-	3	40	60	100	2
7	13MC107	C Programming Lab	-	3	40	60	100	2
8	13MC108	I.T. Workshop and Accounting Lab	-	3	40	60	100	2
Contact Periods / Week			**20**	**9**	**320**	**480**	**800**	
Total Periods / Week			**29**		**Total Credits**			**26**

MCA II Semester

Sl.No	Course Code	Subject	Scheme of instruction (Periods / week)		Scheme of Examination			No. of Credits
			Th	Lab	IM	EM	Total Marks	
1	13MC201	Systems Programming	4	-	40	60	100	4
2	13MC202	Data Structures	4	-	40	60	100	4
3	13MC203	Operating Systems	4	-	40	60	100	4
4	13MC204	Principles of Programming Languages	4	-	40	60	100	4
5	13MC205	Organizational Structures and Personnel Management	4	-	40	60	100	4
6	13MC206	Operating Systems Lab	-	3	40	60	100	2
7	13MC207	Data Structures Using C++ Lab	-	3	40	60	100	2
8	13MC208	Soft Skills Lab	-	3	40	60	100	2
Contact Periods / Week			**20**	**9**	**320**	**480**	**800**	
Total Periods / Week			**29**		**Total Credits**			**26**

MCA III Semester

Sl.No	Course Code	Subject	Scheme of instruction (Periods / week)		Scheme of Examination			No. of Credits
			Th	Lab	IM	EM	Total Marks	
1	13MC301	Database Management Systems	4	-	40	60	100	4
2	13MC302	Software Engineering	4	-	40	60	100	4
3	13MC303	Design and Analysis of Algorithms	4	-	40	60	100	4
4	13MC304	Java Programming	4	-	40	60	100	4
5	13MC305	Operations Research	4	-	40	60	100	4
6	13MC306	Database Management Systems Lab	-	3	40	60	100	2
7	13MC307	Java Programming Lab	-	3	40	60	100	2
8	13MC308	Seminar-I	-	-	100	-	100	2
Contact Periods / Week			**20**	**6**	**380**	**420**	**800**	
Total Periods / Week			**26**		**Total Credits**			**26**

MCA IV Semester

Sl.No	Course Code	Subject	Scheme of instruction (Periods / week)		Scheme of Examination			No. of Credits
			Th	Lab	IM	EM	Total Marks	
1	13MC401	Computer Networks	4	-	40	60	100	4
2	13MC402	Linux Programming	4	-	40	60	100	4
3	13MC403	Data Warehousing and Data Mining	4	-	40	60	100	4
4	13MC404 13MC405 13MC406	**Elective-I** 1.Artificial Intelligence 2.Human Computer Interaction 3.Design Patterns	4	-	40	60	100	4
5	13MC407 13MC408 13MC409	**Elective-II** 1.Computer Graphics 2.Neural Networks and Fuzzy Systems 3.Distributed Systems	4	-	40	60	100	4
6	13MC410	Linux Programming Lab	-	3	40	60	100	2
7	13MC411	Data Warehousing and Data Mining Lab	-	3	40	60	100	2
8	13MC412	Qualitative and Quantitative Analysis	2	-	40	60	100	2
Contact Periods / Week			**22**	**6**	**320**	**480**	**800**	
Total Periods / Week			**28**		**Total Credits**			**26**

MCA V Semester

Sl.No	Course Code	Subject	Scheme of instruction (Periods / week)		Scheme of Examination			No. of Credits
			Th	Lab	IM	EM	Total Marks	
1	13MC501	Object Oriented Systems Development	4	-	40	60	100	4
2	13MC502	Web Technologies	4	-	40	60	100	4
3	13MC503	Software Testing Methodologies	4	-	40	60	100	4
4	13MC504 13MC505 13MC506	**Elective-III** 1.Cloud Computing 2.Cryptography and Network Security 3.E-Commerce	4	-	40	60	100	4
5	13MC507 13MC508 13MC509	**Elective-IV** 1.Mobile Application Development 2.Information Retrieval Systems 3.Software Project Management	4	-	40	60	100	4
6	13MC510	Object Oriented Systems Development (Using UML) Lab	-	3	40	60	100	2
7	13MC511	Web Technologies Lab	-	3	40	60	100	2
8	13MC512	Seminar-II	-	-	100	-	100	2
Contact Periods / Week			**20**	**6**	**380**	**420**	**800**	
Total Periods / Week			**26**		**Total Credits**			**26**

MCA VI Semester

Sl.No	Course Code	Subject	Scheme of Examination			No. of Credits
			IM	EM	Total Marks	
1	13MC601	Project Work	-	A/B/C/D	-	16
Contact Periods / Week			**-**	**-**	**-**	**16**
			Total Credits			

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR
(AUTONOMOUS)

Detailed Syllabus

MCA I Semester	L	T	P	[C]
	4	0	0	[4]

(13MC101) PROBLEM SOLVING AND "C" PROGRAMMING

Objectives are to understand

- How to solve the problems through programming approach.
- The algorithm design and flow chart design.
- C programming fundamentals.
- Various elements like arrays, strings, pointers, functions, files in C language.

UNIT- I:

Problem Solving: Problem - Solving Techniques, need for programmed languages, Design of Algorithms, Analysis of Algorithm Efficiency and Analysis of Algorithm Complexity, Pseudo codes, flow charts and decision tables.

C Programming Fundamentals: History of C , program development steps , C Preprocessor, Structure of a C Program, identifiers, keywords, Variables ,Constants, Data Types and Storage, Expressions, Operators, Decision and Loop Control Statements, Input – output statements.

UNIT- II:

Arrays: concepts, declaration, definition, accessing elements, storing elements, types of arrays, applications of arrays.

Strings: Declaration and Initialization of Strings, Array of Strings, Built-in String Functions and Applications, Other String Functions.

UNIT –III:

Functions: Definition, Declaration, Function Prototypes, Storage Classes, Recursion.

Pointers: Pointers and their Characteristics, Address and Indirection Operators, Pointer Type Declaration and Assignment, Pointer Arithmetic, Passing Pointers to Functions, Arrays of Pointers.

UNIT –IV:

Files: concept of a file, text files and binary files, streams, standard I/o, Formatted I/o, file I/o operations, error handling.

Structures and Unions: Declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, type def, bit fields.

C Graphics Basics: Graphics programming, initializing the graphics, C Graphical functions, simple programs.

Text Books:

1. R. G. Dromey, How to Solve it by Computer, Prentice Hall Of India Ltd, New Delhi,1982.
2. Ashok N. Kamthane, Programming with ANSI and Turbo C, Pearson Education, New Delhi,2002.

Reference Books:

1. P. Padmanabham, P. S. Subramanyam,C & Data structures - B.S. Publications.
2. B.W. Kernighan, Dennis M.Ritchie ,The C Programming Language, 2/E, PHI/Pearson Edition,1988.
3. J.A. Jones & K. Harrow ,C Programming with problem solving, , Dreamtech Press.

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MCA I Semester	L	T	P	[C]
	4	0	0	[4]

(13MC102) COMPUTER ORGANIZATION

Objectives are to understand

- The number systems, kmaps, logic gates.
- The basic cpu organization.
- 8086 assembly instructions.
- Memory organization.

UNIT –I:

Digital Fundamentals: Number Systems and Conversions – Boolean Algebra and Simplification – Minimization of Boolean Functions – Karnaugh Map, Logic Gates – NAND – NOR Implementation.

Intel 8086 Assembly Language Instructions-I: Data transfer instructions, input- output instructions, address transfer, Flag transfer and arithmetic, logical, shift, and rotate instructions

UNIT –II:

Basic CPU Organization: Introduction to CPU, Instruction formats-INTEL-8086 CPU architecture-Addressing modes - generation of physical address- code segment registers, Zero, one, two, and three address instructions.

Intel 8086 Assembly Language Instructions-II: Conditional and unconditional transfer, iteration control, interrupts and process control instructions, assembler directives, Programming with assembly language instructions.

UNIT- III:

Combinational And Sequential Circuits: Design of Combinational Circuits – Adder/ Subtracter – Encoder – Decoder – MUX / DEMUX – Comparators, Flip Flops – Triggering **–** Master – Slave Flip Flop – State Diagram and Minimization **–** Counters – Registers.

UNIT- IV:

Memory Organization: Memory hierarchy, Main memory-RAM, ROM chips, Memory address map, memory contention to CPU, Associative Memory-Hardware logic, match, read and write logic, Cache Memory-Associative mapping, Direct mapping, Set-associative mapping, hit and miss ratio.

Text Books:

1. M. Morris Mano , Computer System Architecture, 3rd Edition, PHI/Pearson Education,2008.
2. Douglas Hall, Microprocessors and Interfacing, 2nd Edition, Tata McGraw-Hill,2005.

Reference Books:

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky ,Computer Organization, Vth Edition, McGraw Hill.
2. Sivarama P.Dandamudi , Fundamentals of Computer Organization and Design, Springer Int,2003.
3. William Stallings, Computer Organization and Architecture, 7th Edition, Pearson/PHI,2007.
4. M. Morris Mano, Digital Design, 3rd Edition, PHI/Pearson Education, 2007.

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MCA I Semester	L	T	P	[C]
	4	0	0	[4]

(13MC103) DISCRETE STRUCTURES AND GRAPH THEORY

Objectives:

- To make Understand mathematical logic, predicates.
- Understand relations, algebraic structures.
- Understand the combinatory and graph theory.

UNIT –I:

Mathematical Logic: Statements and notations, connectives, Well formed formulas, tautologies, equivalence of formulas, Duality law, Tautological Implications, other connectives, Normal forms, Rules of inference, consistency of premises and Indirect method of proof.

Predicates: Predicates, variables a n d quantifiers, predicate formula, free and bound variables, inference theory of the predicate calculus.

UNIT –II:

Relations: Properties of binary relations, equivalence relations, compatibility relations, partial ordering relations, Hasse diagrams.

Functions: Inverse functions, composition of functions, recursive function, Lattices, The pigeon-hole principle.

Algebraic Structures: Algebraic system examples and general properties, semi groups and monoids, groups, subgroups, homomorphism, isomorphism.

UNIT –III:

Combinatorics: Basics of counting, Combinations and permutations, Enumeration of Combinations and permutations , Enumerating Combinations and permutations with repetitions, Enumerating permutations with constrained repetitions, binomial coefficients, The binomial and Multinomial theorems , The principle of inclusion- exclusion.

Recurrence Relation: Generating functions of sequences, calculating coefficients of generating function, recurrence relation, solving recurrence relations by substitution and generating functions, methods of characteristics roots.

UNIT- IV:

Graphs: Introduction to graphs, types of graphs, graph basic terminology and special types of simple graphs, representation of graphs and graph isomorphism, Spanning Tree, graph traversal techniques(BFS & DFS) ,Minimum Spanning Tree Algorithms, Euler paths and circuits, Hamiltonian paths and circuits, planar graphs, Euler's formula, graph coloring.

Text Books:

1. J. P. Trembly, R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, TataMcGraw Hill, India, 1997.
2. Kenneth H. Rosen, Discrete Mathematics and its Applications, 6th edition, Tata McGraw Hill, India.

Reference Books:

1. C. L. Liu, D. P. Mohapatra , Elements of Discrete Mathematics, 3rd edition, McGraw Hill, India, 2008.
2. Ralph P. Grimaldi and B. V. Ramana, Discrete and Combinatorial Mathematics- an Applied Introduction, 5th edition, Pearson Education, India, 2006.

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(13MC104) PROBABILITY AND STATISTICS

Objectives: The Subject is aimed at developing the basic mathematical skills of engineering students that are imperative for effective understanding of engineering subjects. The topics introduced will serve as basic tools for specialized studies in many engineering fields.

UNIT – I:

Probability & Random Variables

Conditional probability – Baye's theorem – Discrete and continuous random variables – Distributions – Distribution functions - Binomial – Poisson – Normal distributions.

UNIT – II:

Test of Hypothesis – Population and sample – Confidence interval of mean from normal distribution – Statistical Hypothesis – Null and Alternative Hypothesis – Level of Significance – Test of Significance – Test based on normal distribution – Z – test for means and proportions; small samples – t-test for one sample and two sample problems and paired t –test, F – test and Chi squared test (testing of goodness of fit and independence.

UNIT – III:

Analysis of variance one way classification and two way classification (Latic square Design and RBD)

UNIT – IV:

Statistical Quality Control: Concept of Quality of a manufacture product – Defects and defectives – causes of variations – Random and assignable

Queuing theory – Pure Birth and Death process – M/M/1 and their related simple problems

Text Books:

1. E. Keshava Reddy & E Rukmangadachari, Probability and Statistics,1/e, Pearson Education

2. Dr J Ravichandran , Probability and Statistics –– Wiley – India Publishers

Reference Books:

1. TKV Iyengar et al, Probability and Statistics , S.Chnad Publications
2. Dr. B.S. Grewal, Higher Engineering Mathematics, Khanna Publication,1988.
3. Erwin Kreyzig , Advanced Engineering Mathematics ,2010.
4. Purna Chandra Biswal, Probability & Statistics, Eastern Economy Edition

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(13MC105) ACCOUNTING AND FINANCIAL MANAGEMENT

Objective: The objective of this course is to acquaint the students regarding Financial Management tools and Accounting Techniques in Financial decision making.

UNIT-I:
Introduction to Accounting: Principles, Concepts and Conventions, Double Entry System of Accounting, Classification of Accounts and Debit-Credit Rules.
Financial Statements: Introduction to basic books of accounts, Journal and ledger-trial balance-preparation of final accounts: trading account, profit and loss account and balance sheet.

UNIT -II:
Introduction to Financial Management: Meaning and scope, goals & objectives, role of financial manager, sources of finance time value of money-goals of financial management, leverages: operation, financial leverage and combined leverage. (Simple problems)
Capital structure: Cost of capital: cost of equity, preference shares and bonds –weighted average cost of capital. (Simple problems)

UNIT -III:
Financial Analysis Through Ratios: Ratio Analysis, classification of ratios – Short term solvency and Long term solvency – profitability ratios- Analysis and interpretation of Financial Statements. (Simple problems)
Funds Flow and Cash Flow Analyses: Meaning, importance, statement of changes of working capital, statement of sources and Application of Funds. Cash Flow Analysis: Cash Flow Statements: Preparation, Analysis and Interpretation. (Simple problems)

UNIT -IV:
Break Even Analysis: Concept of Break Even Point, Cost –Volume –Profit analysis, Determination of Break Even Point, Margin of Safety and P/V ratio. (Simple problems)
Capital Budgeting: Capital and its significance, types of capital, estimation of fixed and working capital requirements, methods and sources of raising capital. Capital budgeting: features proposals, methods of capital budgeting, Payback method, Accounting Rate of Return (ARR), Net Present Value Method (NPV). (Simple problems)

Codes/Tables: Present Value Tables need to be permitted into the examination Hall.

Reference Books:

1. Dr.S.N.Maheswari. Sultan Chand ,Financial accounting , 2009
2. Prasanna Chandra, Financial Management , TMH, New Delhi.
3. I M Pandey, Financial Management ,2nd edition ,Vikas Publishing House, New Delhi.
4. Van Horn, James c, Financial Management and Policy , Prentice Hall of India,1977.
5. Khan and Jain, Financial Statement Analysis, PHI, 2009
6. Sundhindra Bhat , Financial Management , Excel:2009

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(13MC106) COMPUTER ORGANIZATION LAB

Objective

- To make implement the common problems through the Assembly programming Language.

EXPERIMENTS LIST:

1. Verification of truth tables of Logic Gates
2. TTL characteristics
3. Verification of Demorgan's Laws
4. Implementation of Adders and Subs tractors
5. Verification of Flip-Flops (RS, JK, D, T)
6. Design of 3-to-8 Decoder
7. Encoder
8. Multiplexer
9. De-Multiplexer
10. A computer uses RAM chips of 1024 X 1 capacities.
    a. How many chips are needed, and how should their address lines be connected to provide a memory capacity of 1024 bytes?
    b. How many chips are needed to provide a memory capacity of 16K bytes?
11. A computer employs RAM chips of 256X8 and ROM chips of 1024 X 8. The computer needs 2K bytes of RAM, 4K bytes of ROM, and four interface units, each with four registers. A memory-mapped I/O configuration is used. The two highest-order bits of the address bus are assigned 00 for RAM, 01 for ROM, 10 for interface registers.
    a. How many RAM and ROM chips are needed?
    b. Draw a memory-address map for the system.
    c. Give the address range in hexadecimal for RAM, ROM and interface.
12. Obtain the complement function for the match logic of one word in an associative memory. Draw the logic diagram for it and compare with the actual match logic diagram.
13. A two-way set associative cache memory uses blocks of four words. The cache can accommodate a total of 2048 words from main memory. The main memory size is 128K X 32.
    a. Formulate all pertinent information required to construct the cache memory.
    b. What is the size of the cache memory?
14. A digital computer has a memory unit of 64K X 16 and a cache memory of 1K words. The cache uses direct mapping with a block size of four words.
    a. How many bits are there in each word of cache, and how are they divided into functions? Include a valid bit.
    b. How many bits are there in the tag, index, block, and word fields of the address format?
    c. How many blocks can the cache accommodate?

15. An address space is specified by 24 bits and the corresponding memory space by 16 bits.
    a. How many words are there in the address space?
    b. How many words are there in the memory space?
    c. If a page consists of 2K words, how many pages and blocks are there in the system?
16. A virtual memory has a page size of 1K words. There are eight pages and four blocks. The associative memory page table contains the following entries. Make a list of all virtual addresses (in decimal) that will cause a page fault.

Page	Block
0	3
1	1
4	2
6	0

ASSEMBLY LANGUAGE PROGRAMMING

Write assembly language programs for the following using MASAM.

1. Write assembly language programs to evaluate the expressions:
    i) a = b + c –d * e
    ii) z = x * y + w – v +u / k
    a. Considering 8-bit, 16 bit and 32 bit binary numbers as b, c, d, e.
    b. Considering 2 digit, 4digit and 8 digit BCD numbers.
    Take the input in consecutive memory locations and results also. Display the results by using "int xx" of 8086. Validate program for the boundary conditions.
2. Write an ALP of 8086 to add two exponential numbers which are in IEEE 754 notation.
   Display the results by using "int xx" of 8086. Validate program for the boundary conditions.
3. Write an ALP of 8086 to take N numbers as input. And do the following operations on them.
    a) Arrange in ascending and descending order.
    b) Find max and minimum
    c) Find average Considering 8-bit, 6 bit binary numbers and 2 digit, 4digit and 8 digits BCD numbers. Display the results by using "int xx" of 8086. Validate program for the boundary conditions.
4. Write an ALP of 8086 to take a string of as input (in 'C' format) and do the following Operations on it.
    a) Find the length b) Find it is Palindrome or not
    c) Find whether given string substring or not.
    d) Reverse a string e) Concatenate by taking another sting
    Display the results by using "int xx" of 8086.
5. Write the ALP to implement the above operations as procedures and call from the main procedure.
6. Write an ALP of 8086 to find the factorial of a given number as a Procedure and call from the main program which display the result.

7. Write an assembly language program to encrypt digits as shown below:

   Input digit: 0 1 2 3 4 5 6 7 8 9

   Encrypted digit: 4 6 9 5 0 3 1 8 7 2

   The program should accept a string consisting of digits. The encrypted string should be displayed using "int xx" of 8086.

8. Write a procedure to locate a character in a given string. The procedure receives a pointer to a string and character to be located. When the first occurrence of the character is located, its position is returned to main. If no match is found, a negative value is returned. The main procedure requests a character string and a character to be located and displays the result.

9. Write an assembly language program to read a string of characters from the user and that prints the vowel count. Display the results by using "int xx" of 8086.

   ex. Input: Advanced Programming in UNIX

   Output:

Vowel	count
a or A	3
e or E	1
i or I	3
o or O	1
u or U	1

Reference Books:

1. P. Abel , IBM PC Assembly Language and Programming, 5th Edition, PHI/Pearson Education.

2. Sivarama P.Dandamudi, Introduction to Assembly Language Programming, Springer Int. Edition, 2003.

3. W.A.Triebel, A.Singh, N.K.Srinath, The 8088 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware and Application, 4th edition, , Pearson Edition.

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(13MC107) C PROGRAMMING LAB

Objective: The objective of this lab is to make student learn techniques for attacking and writing C programs for various types of problems. The emphasis should be on writing correct and efficient programs in C. The programs should include all the ones suggested below but should not be limited to them only. The examiner need not stick to these programs only in the examination.

EXPERIMENTS LIST:

Basic Techniques:

1. Swapping of the contents of two variables
2. Finding the sum of digits of a given number
3. Reversing a given number.

Decision Making:

4. Finding the largest and the smallest of a given array
5. Solving a quadratic equation
6. Selecting an operation based on a menu.

Looping Techniques and Arrays:

7. Finding the sum to n terms of a sine series
8. Matrix Multiplication- Transpose
9. Polynomial addition- Polynomial Multiplication
10. Sorting
11. Searching

Characters and String Handling:

12. Finding the length of string
13. Reversal of string
14. Concatenation of two strings
15. Checking whether it is a palindrome or not
16. Converting upper case alphabets to lowercase and vice versa in a string.

Pointers, Structures and Unions:

17. Finding the sum of all elements of an array using pointers
18. Swapping the contents of two variables using pointers
19. Finding the first and second rank holders and printing their names and roll numbers, in a class of 60 students using structures
20. Defining a complex number as structure and wring a program to illustrate the operations on complex numbers
21. Some examples of Unions.

Files and other Topics:

2 2 . Copying and concatenation of files
23. Bit wise operations
24. Command line parameters
25. C preprocessor directives
26. Macros.

Text Books:

1. Ashok N. Kamthane, Programming with ANSI and Turbo C, Pearson Education, New Delhi,2002.
2. R. G. Dromey, How to Solve it by Computer, Prentice Hall Of India Ltd, New Delhi, 1982.

Reference Books:

1. M. G. Venkateshmurthy, Programming techniques through C, Pearson Education, New Delhi.
2. Ashok N. Kamthane, Programming with ANSI and Turbo C, Pearson Education, New Delhi.
3. Byron s Gottfried, Programming with C, Schaum's Outline series, Tata McGraw Hill. Publishing Company, New Delhi.

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(13MC108) I.T.WORKSHOP AND ACCOUNTING LAB

Objectives: The IT Workshop for engineers is a training lab course spread over 40 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel and Power Point.

EXPERIMENTS LIST:

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. **The students should work on working PC to disassemble and assemble to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.**

Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email.

Productivity tools module would enable the students in crafting professional word documents, excel spread sheets and power point presentations. (**Recommended to use Microsoft office 2007 in place of MS Office 2003)**

PC Hardware

Exercise 1 – Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Exercise 2 – Task 2: Every student should disassemble and **assemble the PC back to working condition.** Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Exercise 3 – Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Exercise 4 – Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Exercise 5 – Task 5: Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva

Exercise 6 – Task 6: Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Internet & World Wide Web

Exercise 7 - Task 1: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Exercise 8 - Task 3: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

MS Word

Exercise 9&10: The mentor needs to give an overview of Microsoft (MS) word 2007: Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word. Give a task covering to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Inserting table, using Drawing toolbar in word.

MS Excel

Exercise 11&12: The mentor needs to tell the importance of MS office 2007 Excel as a Spreadsheet tool covering Accessing, overview of toolbars, saving excel files, Using help and resources., Also give a task that is covering the features like Gridlines, Format Cells, Summation, auto fill, Formatting Text.

MS Power Point

Exercise 13&14: Students will be working on MS power point that helps them create basic power point presentation. Topics covered during this Exercise include :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in Power point. Students shall be given a model power point presentation which needs to be replicated (exactly how it's asked).

References:

1. Vikas Gupta, Comdex Information Technology course tool kit, WILEY Dream tech
2. Cheryl A Schmidt, The Complete Computer upgrade and repair book,3rd edition, WILEY Dreamtech
3. Evans Et Al, Introduction to Information Technology, 1/e, ITL Education Solutions limited, Pearson Education.
4. Kate J. Chase , PC Hardware and A+Handbook , PHI (Microsoft)
5. Leslie Lamport, LaTeX Companion , PHI/Pearson.
6. David Anfinson and Ken Quamme, IT Essentials PC Hardware and Software Companion Guide Third Edition, CISCO Press, Pearson Education.
7. Patrick Regan, IT Essentials PC Hardware and Software Labs and Study Guide, Third Edition, CISCO Press, Pearson Education.
8. S.J.Bigelow , Troubleshooting, Maintaining and Repairing PCs, 5th edition,TMH.

COMPUTERIZD ACCOUNTING TALLY LAB

Objectives: To make the student to implement the common accounts problems with the software called Tally.

EXPERIMENTS LIST:

1. Creation of company, Accounts Configuration, Classification of Accounts using Tally.
2. Accounts Masters, Accounts Voucher - Voucher Entry, conversion, Interest Calculation, Printing of voucher using Tally.
3. Create a Contra Voucher, Payment and Receipt Voucher using Tally.
4. Create Sales and Purchase Voucher, Credit notes and Debit notes using Tally.
5. Create Trading Account, Profit / Loss Account, Balance Sheet using Tally.

Text Books:

1. Dinesh Maidasani , Accounting with Tally 9.0, laxmi publications.
2. Namrata Agrawal , Financial Accounting on Computers Using Tally, 2000.

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(13MC201) SYSTEMS PROGRAMMING

Objectives:

- To make Understand what is system programming.
- To let the student get thorough about macro processors.
- To make Understand about loaders and compiler.

UNIT –I:

Introduction to Systems Programming: Machine Structure - Machine and Assembly Language Programming with IBM 360/370 - Grammars -Types of Grammars –Languages, FSM

Assemblers: Concepts of Single Pass, Two- Pass and Multi- Pass Assemblers, Design of a Single and Two-Pass Assembler.

UNIT- II:

Macros and Macro Processors: Definition - Types of Macros - Macro Instructions - Features of Macro Facility like conditional Macro Expansion - Macros Calls within Macros - Macro Definitions within Macros - Design of **Macro Processors**: Single-Pass and Two-Pass.

UNIT- III:

Loaders: Absolute Loader - Relocation Loader - Binders - Dynamic Loading and Linking – Design of Absolute Loader and Direct Linking Loaders.

UNIT- IV:

General Model of Compiler: Phase of a Compiler - Detailed Discussion of different Phases

Introduction to Software Tools: Text editors, Interpreters, Program Generators, Debug Monitors.

Text Books:

1. John J. Donovan, Systems Programming, Tata Mc Graw Hill, 2001.

Reference Books:

1. Dhamdhere , System Programming and Operating Systems & System Programming, IInd Revised Edition, Tata Mc Graw Hill.,
2. Leland. L. Beck, System Software, Pearson Education.

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(13MC202) DATA STRUCTURES

Objectives:

- Understand basic data structures such as arrays, lists, stacks, queues, trees, hash tables, search trees.
- Choose the appropriate data structure for a specified application.
- Implement various searching and sorting algorithms in C++.
- Write programs in C++ to solve problems using data structures such as arrays, lists, stacks, queues, trees, hash tables, and search trees.

UNIT- I:

Basic concepts: Data types, Abstract Data types, Data Structures, Algorithms, Performance analysis-time complexity and space complexity, Asymptotic Analysis-Big O, Omega and Theta notations, Basic concepts of STL(Standard Template Library)-Containers, Iterators, Algorithms.

Introduction to Linear and Non Linear data structures, Linear data structures-Linear Lists, Sequential and linked allocation, The list ADT, array and linked implementations, Singly Linked Lists-Operations-Insertion,Deletion,DoublyLinkedLists-Operations-Insertion,Deletion,Circularly linked lists.

Representation of single, two dimensional arrays, sparse matrices and representation.

Stack ADT, Definition, operations array and linked implementations, applications-infix to postfix conversion, Postfix expression evaluation, recursion implementation, Queue ADT, definitions, operations, array and linked representations, circular queues, Insertion and deletion operations, Deque(Double ended queue)ADT, array and linked implementations.

UNIT- II:

Non Linear data structures- Trees – Basic Terminology, Binary tree ADT, array and linked representations, traversals, threaded binary trees, Priority Queue ADT- Implementation, Heaps.

Graphs – Introduction, Basic Terminology, Graph Representations- Adjacency matrix, Adjacency lists, Graph traversals-DFS and BFS.

UNIT- III:

Searching – Linear Search, Binary Search. Hashing - Introduction, hash tables, hash functions, collision resolution methods, comparison of searching methods.

Sorting: Bubble sort, insertion sort, selection sort, radix sort, quick sort, merge sort, heap sort, comparison of sorting methods.

UNIT- IV:

Search trees – binary search trees, definition, ADT, implementation, operations – searching, insertion, deletion, AVL trees (definition and example only), B- trees, definition, B tree of order m, operations – insertion and searching, introduction to Red – Black and Splay trees (Elementary treatment – only definition and examples), comparison of search trees, pattern matching algorithm – The Knuth – Morris – Pratt algorithm, Text comparison – Huffman coding algorithm, Tries (example only)

Text Books:

1. S.Sahni, Data structures, Algorithms and Applications in C++, University Press, 2005.
2. Adam Drozdek , Data structures and algorithms in C++, 3rd Edition, Cengage Learning, 2005.
3. Mark Allen Weiss, Data structures and Algorithm Analysis in C++, Pearson Education. Ltd.,

Reference Books:

1. Michael T.Goodrich, R.Tamassia and D.Mount , Data structures and Algorithms in C++, Wiley student edition, John Wiley and Sons.
2. L.Nyhoff, ADTs, Data structures and problem solving with c++, second edition, Pearson (Prentice Hall)
3. D.S. Malik, Data Structures using C++, Cengage Learning, India Edition.
4. W.H.Ford and W.R.Topp, Data structures with c++ using STL, 2nd edition, Pearson (Prentice Hall)
5. V.H.Patil, Data Structures using C++, Oxford University Press.
6. Langsam, Augenstein and Tanenbaum, Data structures using C and C++, PHI.

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(13MC203) OPERATING SYSTEMS

Objectives:

- To make Understand overview of how the operating system functions.
- To let the student get an idea on cpu scheduling, memory management.
- To make Understand about file system.
- To make understand about deadlocks management.

UNIT –I:

Operating System Introduction, Structures - Simple Batch, Multi programmed, time-shared, Personal Computer, Parallel, Distributed Systems ,Real-Time Systems , System components, Operating-System services, System Calls, Virtual Machines, System Design and Implementation.

UNIT- II:

Process and CPU Scheduling - Process concepts and scheduling, Operation on processes, Cooperating Processes, Threads, and Interposes Communication Scheduling Criteria, Scheduling Algorithm, Multiple -Processor Scheduling, Real-Time Scheduling.

UNIT- III:

Memory Management and Virtual Memory - Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging. Demand Paging, Performance of Demanding Paging, Page Replacement, Page Replacement Algorithm, Allocation of Frames, Thrashing.

UNIT- IV:

File System Interface and Implementation -Access methods, Directory Structure, Protection, File System Structure, Allocation methods, Free-space Management, Directory Management, Directory Implementation, Efficiency and Performance.

Deadlocks - System Model, Dead locks Characterization, Methods for Handling Dead locks Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock.

Text Books:

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Operating System Principles, 7th Edition, John Wiley
2. Andrew. S. Tanenbaum, Distributed Operating System, PHI.

Reference Books:

1. Crowley, Operating System A Design Approach, TMH.
2. Stallings , Operating Systems – Internals and Design Principles, Fifth Edition, Pearson Education/PHI,2005.

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MCA II Semester

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(13MC204) PRINCIPLES OF PROGRAMMING LANGUAGES

Objectives:

- To make Understand about the various principles, guidelines and background algorithms that was to be implemented while creating the programming constructs.

UNIT –I:

A survey of Programming Paradigms**, Imperative Programming:** Names, Bindings, and Type Checking; Scopes.

UNIT -II

Data Types: Primitive Data Types, Character String Type, User-Defined Ordinal Types, Array Types, Record Types, Union Types, Set Types, and Pointer Types

UNIT- III:

Statement-Level Control; Subprograms, Abstract Data Types.

UNIT- IV:

Support for Object-Oriented Programming, Functional Programming, Logic Programming, Scripting Languages

Text Books:

1. Robert W. Sebesta, "Concepts of Programming Languages", Seventh Edition, Pearson Education, 2009.

Reference Books:

1. Terrence W. Pratt & Mervin V. Zelkowitz, "Programming Languages Design and Implementation",Fourth Edition, Pearson Education , 2008.
2. Kenneth C. Louden, "Programming Languages Principles and Practice", Second Edition, Cengage Learning, 2008.

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(13MC205) ORGANIZATIONAL STRUCTURES AND PERSONNEL MANAGEMENT

Objectives:

- To make Understand how a organization functions.
- To make Understand how man power planning, training and development in organizations.
- To make understand the human resource planning in organizations.

UNIT- I:

Introduction to Management: Concepts of Management– nature, importance and functions and theories of management, systems approach to management, leadership styles and social responsibilities of management.

Introduction to Organization: Designing Organizational structures: Basic concepts related to Organization – Departmentation and Decentralization, types and evaluation of mechanistic and structures of organization and suitability.

UNIT- II:

Decision Process Approach: Parts of organization system, development of corporate strategy, dynamics of decision, role of system. Types of models: mathematical planning models, deterministic and probabilistic models.

Personnel Management: Evolution, objectives, personnel policies. Personnel management vs HRM, position of the personnel department in the organization, Role of personnel manager as line manager and staff manager.

UNIT –III:

Man Power Planning: Need-strategies and limitations, manpower inventory, manpower forecasting, job description, recruitment, job specification and selection, interviewing techniques, transfers and promotion policies. **Training and Development:** Objectives and policies planning, organizing the training department, training manager and his job, on and off the job training techniques, career planning, objectives of performance appraisal.

UNIT- IV:

Understanding Human Behavior: Personality – Johari Window – Transactional Analysis. Perception: Perceptual process, Development of Attitudes and Values, Understanding Group Dynamics, Team Effectiveness, Strategies to deal with conflicts and stress. **Contemporary Strategies:** Total Quality Management (TQM), six sigma, people capability maturity model (PCMM) levels, performance management, business process outsourcing (BPO), business process re-engineering, bench marking and balanced score card.

Text Books:

1. P.Subbarao, Organizational Structures And Personnel Management, HPH, 2009.
2. Mamoria & Gankar , Personnel Management, HPH, 2009.

Reference Books:

1. Robbins , Organizational Behavior, Pearson, 2008.
2. Martand T Telsang, Industrial Business Management, S.Chand.

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(13MC206) OPERATING SYSTEMS LAB

Objectives:

- To let the student implement the various operating system functionalities through the C programming language.

List of Sample Problems/Experiments:

1. Simulate the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS d) Priority

2. Simulate all file allocation strategies
   a) Sequential b) Indexed c) Linked

3. Simulate MVT and MFT

4. Simulate all File Organization Techniques
   a) Single level directory b) Two level c) Hierarchical d) DAG

5. Simulate Bankers Algorithm for Dead Lock Avoidance

6. Write a C program to create a child process and allow the parent to display “Hello” and the child to display “Welcome” on the screen.

7. Simulate all page replacement algorithms such as
   a) FIFO b) LRU c) LFU

8. Simulate Paging Technique of memory management.

9. Write C programs that make a copy of a file using
   i) standard I/O and ii) system calls

10. Write C programs that count the number of blanks in a text file using
    i) standard I/O ii) system calls.

11. Write C programs to implement Assemblers and Macro Processors

Reference Books:

1. P.P. Choudhury, Operating Systems, PHI Learning Private Ltd.
2. R.Chopra, Operating Systems, S.Chand and Company Ltd

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(13MC207) DATA STRUCTURES USING C++ LAB

Objectives:

- To let the student implement the various Data Structures with C++ language.

EXPERIMENTS LIST:

1. Write C++ programs to implement Stack ADT using an array.
2. Write C++ programs to implement Queue ADT using an array
3. Write a C++ program that reads an infix expression, converts the expression to postfix form.
4. Write a C++ program that evaluates the postfix expression (use stack ADT).
5. Write a C++ program to implement circular queue ADT using an array.
6. Write a C++ program that uses stacks to test whether the given string is a palindrome.
7. Write a C++ program to add two Sparse Matrices.
8. Write a C++ program that determines whether parenthetic symbols ( ), { } and < > are nested correctly in a string of characters (use stack ADT or otherwise).
9. Write C++ programs to implement singly linked list.
10. Write C++ programs to implement Stack ADT using Singly Linked Lists.
11. Write C++ programs to implement Queue ADT using Singly Linked Lists.
12. Write C++ programs to implement the dequeue using Doubly Linked List.
13. Write a C++ program to perform the following operations:
    a) Insert an element into a binary search tree.
    b) Delete an element from a binary search tree.
    c) Search for a key element in a binary search tree.
14. Write C++ programs to traverse the binary tree in
    a) Pre order b) In order and c) Post order.
15. Write C++ programs for the implementation of BFS and DFS for a given graph.
16. Write C++ programs for implementing the following sorting methods:
    a) Bubble sort b) Selection sort C) Insertion sort d) Quick sort e) Merge sort
17. Write C++ programs to implementing the following searching methods:
    a) Linear search b) Binary search

Reference Books:

1. Yaswant Kanetkar, Data Structures Through C++.
2. Aaron M.Tenenbaum, Data Structures Through C and C++, 2nd edition, 2007.
3. Balaguruswamy, Data Structures through C++.

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(13MC208) SOFT SKILLS LAB

Objectives: To equip students with effective speaking and listening skills in English, help them develop the soft skills and people skills which will make them to excel in their jobs and enhance to students' performs at placement interviews.

Activity– 1: Phonetics, Introduction to Vowel Sounds & Consonants

Activity– 2: Introduction to Stress and Intonation.

Activity– 3: Situational Dialogues.

Activity– 4: Group Discussions

Activity– 5: Debate.

Activity– 6: Just A Minute

Activity– 7: Resume or Curriculum Vitae and Covering Letter.

Activity– 8: Interview Skills

Reference:

1. Dr. K. Alex ,"Soft Skills" – Know yourself & Know the world
2. Huckin and Olsen , Technical Writing and professional communication, Tata Mc Graw-Hill 2009.
3. Barrett Whitener, Speaking about Science, A Manual for Creating Clear Presentations by Scott Morgan and Cambridge University press, 2006
4. Meenakshi Raman & Sangeeta Sharma, Technical Communication Oxford University Press 2009.
5. M. Ashraf Rizvi, Resume's and Interviews, Tata Mc Graw-Hill, 2008
6. KK Ramachandran and KK Karthick, Form Campus To corporate Macmillan Publishers India Ltd, 2010
7. Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, English Language Communication: A Reader cum Lab Manual Anuradha Publications, Chennai 2008.
8. K R Lakshminarayan and T. Muruguvel, Managing Soft Skills, Sci-Tech Publication, 2010
9. John X Wang, Business Communication, CRC Press, Special Indian Edition, 2008

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(13MC301) DATABASE MANAGEMENT SYSTEMS

Objectives:

- To make Understand Data base architecture.
- To let the student get clear knowledge on relational models and computations of data.
- To make Understand SQL queries.
- To understand about Transaction management.

UNIT- I:

Data Base System Applications, Database system vs File System, view of data, data abstraction, instances and schemas, Data models – ER-model, Relational Model, other models, Database Languages – Data base access for application Programs – Transaction Management – Storage Manager – The Query Processor – History of Database Systems. Database design and ER diagrams, Beyond ER entities, Attributes, Entity sets, Relationships and Relationship Sets, Additional features of ER model, Conceptual design of ER model.

Relational Model: Introduction to relational model, Integrity constraint over relations, Enforcing integrity constraints, Querying Relational Data, Logical Database Design, Introduction to views, Destroying/ Altering tables and views.

Relational Algebra and Calculus: Relational algebra, Selection and Projection set operations, renaming, joins, divisions, examples. Relational Calculus, Domain relational calculus, Tuple relational calculus, Expressive power of Algebra and Calculus.

UNIT –II:

Form of basic SQL Queries: Examples of basic sql queries, introduction to nested queries, correlated nested queries set, comparison operators, Aggregative Operators, null values, comparison using null values, Logical Connectivities, AND, OR, NOR, Impact on SQL constructs, Outer Joins, Disallowing NULL Values, Complex Integrity Constraints in SQL Triggers, Active Databases.

Schema Refinement: problems caused by redundancy, decompositions, problems related to decompositions, Reasoning about normal forms, BCNF, lossless join decomposition, Dependency preserving decomposition, schema refinement in data base design, multi values dependencies, Fourth normal form.

UNIT- III:

Overview of Transaction Management: ACID properties, Transactions and Schedules, Concurrent Execution of Transaction, Lock based concurrency control, performance locking, Transaction Support in SQL, introduction to crash recovery.

Concurrency Control: Serializability and recoverability, Introduction to lock management, Lock Conversions, Dealing with deadlocks, Specialized Locking Techniques, Concurrency without locking.

Crash Recovery: Introduction to ARIES, the Log and other Recovery related structures, the write ahead log protocols, check pointing, recovering from a system crash, media recovery, other approaches and interactions with concurrency control.

UNIT- IV:

Overview of Storage and Indexing: Data on external storage, File organization and indexing, Cluster indexes, primary and secondary indexes, Index Data Structures, Hash based Indexing, Tree based indexing, comparison of file organizations, indexes and Performance tuning.

Overview of Query Evaluation: The system catalogue, introduction to operator evaluation, algorithm for relational operations. Tree Structured Indexing: Intuitions for tree indexes, Indexed Sequential Access Methods (ISAM), B+ Trees: a dynamic indexed structure. Hash based indexing: static hashing, extendable hashing, linear hashing and extendable Vs Linear hashing.

Text Books:

1. Raghu Ramkrishnan, Gehrke, “Database Management Systems”, TMH
2. Korth, Sudarshan,Silberschatz, “Database System Concepts”.

Reference Books:

1. Elmasari , Navathe, “Fundamentals of Database Systems”,
2. Thomas Connolly, Carolyn Begg, “Database Systems, A Practical Approach to Design, Implementation & Management” .
3. Han, Kamber, Pei, “Data Mining : Concepts Techniques”.
4. Gertz, Jajodia , “Handbook of Database Security, Applications and Trends”.

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(13MC302) SOFTWARE ENGINEERING

Objectives:

- To make Understand about the common steps of Software Engineering.
- To let the student get thorough knowledge on requirement analysis and software design.
- To make Understand about testing strategies and quality management.

UNIT- I:

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, legacy software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models. Process models: The waterfall model, Incremental process models, Evolutionary process models, specialized process models, The Unified process.

UNIT- II:

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

System models: Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT- III:

Design Engineering: Design process and Design quality, Design concepts, the design model, pattern based software design. Creating an architectural design: software architecture, Data design, Architectural styles and patterns, Architectural Design, assessing alternative architectural designs, mapping data flow into software architecture. Modeling component-level design: Designing class-based components, conducting component - level design, Object constraint language, designing conventional components.

Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT- IV:

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Product metrics: Software Quality, Frame work for Product metrics, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance. Metrics for Process and Products: Software Measurement, Metrics for software quality.

Risk management: Reactive vs Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

Text Books:

1. Roger S Pressman, Software Engineering: A practitioner's Approach, sixth edition. McGraw-Hill International Edition, 2005
2. Ian Somerville, Software Engineering, seventh edition, Pearson education, 2004.

Reference Books:

1. Pankaj Jalote, Software Engineering, A Precise Approach, Wiley India, 2010.
2. Waman S Jawadekar, Software Engineering: A Primer, Tata McGraw-Hill, 2008
3. Rajib Mall, Fundamentals of Software Engineering, PHI, 2005
4. Deepak Jain, Software Engineering, Principles and Practices, Oxford University Press.
5. Diner Bjorner, Software Engineering1: Abstraction and modeling, Springer International edition, 2006.
6. Diner Bjorner, Software Engineering2 : Specification of systems and languages, Springer International edition , 2006.
7. Yingxu Wang,Software Engineering Foundations, Auerbach Publications,2008.

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MCA III Semester

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(13MC303) DESIGN AND ANALYSIS OF ALGORITHMS

Objectives:

- To make Understand general concepts in designing an algorithm.
- To let the student get thorough knowledge on dynamic programming, branch and bound techniques.
- To make Understand about decision trees.

UNIT-I:

Introduction: Notion of Algorithm – Algorithmic Problem solving –Important Problem Types-Fundamental Data Structures-Analysis of Algorithm Efficiency-Analysis framework – Asymptotic notations – Analysis of Non-recursive and recursive algorithms - Empirical Analysis of algorithms-Algorithm Visualization, Limitations of Algorithms.

UNIT-II:

Brute Force-Selection Sort and Bubble Sort- Sequential Search and Brute Force String matching-Closet Pair and Convex Hull Problems-Exhaust Search, Divide and Conquer- Merge sort – Quick Sort – Binary search – Large integer Multiplication and Stassen's Matrix multiplication-closest pair and convex Hull problems.

UNIT-III:

Divide and conquer, Decrease By a Constant Algorithms-Insertion Sort-DFS and BFS-Topological sorting-Generating Combinatorial Objects-Decrease by a Constant factor Algorithms- variable size Decrease Algorithms- Transform and conquer- Horner's Rule and Binary Exponentiation – Problem Reduction

UNIT-IV:

Dynamic Programming- Wars hall's and Floyd's Algorithm – Optional Binary Search Trees – knapsack Problem - Prim's and kruskal's Algorithms - Dijkstra's Algorithm- Huffman Trees.

Decision Trees – NP hard and NP Complete problems-, Branch and Bound- Approximation Algorithms for NP – hard problems

Text Books:

1. Horowitz and Sahni, Fundamentals of Computer Algorithms, Galgothia Publications.
2. Anany Levitin, Introduction to the Design and Analysis of Algorithms, Pearson Education, 2003.

Reference Books:

1. Cormen, Leiserson and Rivest, Introduction to Algorithms, Prentice Hall of India.

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(13MC304) JAVA PROGRAMMING

Objectives:

- To make Understand about how to write programs through java.
- To let the student get thorough knowledge on inheritance, packages, interfaces, util package, files, networking, exception handling.

UNIT- I:

Java Basics - History of Java, Java buzzwords, data types, variables, scope and life time of variables, control flow-block scope, conditional statements, loops, break and continue statements, simple java program, arrays, input and output, Review of OOP concepts, encapsulation, inheritance, polymorphism, classes, objects, constructors, methods, parameter passing, static fields and methods, access control, this reference, overloading methods and constructors, recursion, garbage collection, building strings, exploring string class.

Inheritance – Inheritance concept, benefits of inheritance, Super classes and Sub classes, Member access rules, Inheritance hierarchies, super uses, preventing inheritance: final classes and methods, polymorphism- dynamic binding, method overriding, abstract classes and methods, the Object class and its methods.

Interfaces – Interfaces vs. Abstract classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interface.

UNIT- II:

Packages-Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages.

Data structures creation and manipulation in java – Introduction to Java Collections, Overview of Java Collection frame work, Commonly used Collection classes – ArrayList, Linked List, HashSet, HashMap, TreeMap, Collection Interfaces – Collection, Set, List, Map, Legacy Collection classes – Vector, Hash table, Stack, Dictionary(abstract), Enumeration interface, Iteration over Collections – Iterator interface, ListIterator interface. Other Utility classes – StringTokenizer, Formatter, Random, Scanner, Observable, Using java.util.

Files – streams- byte streams, character streams, text Input/output, random access file operations, Using java.io.

UNIT –III:

Networking in Java – Introduction, Manipulating URLs, Ex. Client/Server Interaction with Stream Socket Connections, Connectionless Client/Server Interaction with Datagrams, Using java.net.

Exception handling – Dealing with errors, benefits of exception handling, the classification of exceptions- exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, built in exceptions, creating own exception sub classes.

Multithreading - Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, interthread communication, thread groups, daemon threads.

UNIT- IV:

GUI Programming with Java - The AWT class hierarchy, Introduction to Swing, Swing vs. AWT,MVC architecture, Hierarchy for Swing components, Containers – Top-level containers – JFrame, JApplet, JWindow, JDialog, Light weight containers – JPanel, A simple swing application, Overview of several swing components- Jbutton, JToggleButton, JCheckBox, JRadioButton, JLabel, JTextField, JTextArea, JList, JComboBox, JMenu, Java's Graphics capabilities – Introduction, Graphics contexts and Graphics objects, color control, Font control, Drawing lines, rectangles and ovals, Drawing arcs, Layout management - Layout manager types – border, grid, flow, box.

Event Handling - Events, Event sources, Event classes, Event Listeners, Relationship between Event sources and Listeners, Delegation event model, Semantic and Low-level events, Examples: handling a button click, handling mouse and keyboard events.

Applets – Inheritance hierarchy for applets, differences between applets and applications, life cycle of an applet - Four methods of an applet, Developing applets and testing, passing parameters to applets.

Text Books:

1. Herbert Schildt, Java: the complete reference, 7th editon, TMH.

2. K.Somasundaram, Advanced Programming in Java2, Jaico Publishing House.

Reference Books:

1. K.Somasundaram, Java: the complete reference, 7th editon, Herbert Schildt, TMH.

2. P.J.Deitel and H.M.Deitel, Java for Programmers, Pearson education / P.J.Deitel and H.M.Deitel , Java: How to Program,8th edition, PHI.

3. Cay S.Horstmann and Gary Cornell, Core Java, Volume 1-Fundamentals, eighth edition, Pearson eduction.

4. D.S.Malik, Java Programming, Cengage Learning.

5. B.Eswara Reddy, T.V.Suresh Kumar, P.Raghavan, Pearson, Object Oriented Programming with Java, Sanguine.

6. R.A. Johnson, An introduction to Java programming and object oriented application development, Cengage Learning.

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(13MC305) OPERATIONS RESEARCH

Objectives:

- To make Understand about linear programming problems and dual problem.
- To make Understand network models, replacement models, game theory.

UNIT- I:

Introduction To Operations Research: Basics definition, scope, objectives, phases, models and limitations of Operations Research.

Linear Programming: Problem, Formulation and Graphical solution of Linear Programming Problem. Simplex Method, Artificial variables Techniques, big -M method, two -phase simplex method, degeneracy and unbound solutions.

Dual Problems: Relation between primal and dual problems – Dual simplex method

UNIT –II:

Transportation Problem: Formulation, solution, unbalanced Transportation problem. Finding basic feasible solutions, North-West corner rule, least cost method and Vogel's approximation method. Optimality test – MODI Method.

Assignment Model: Formulation, Hungarian method for optimal solution, solving unbalanced problem, Traveling salesman problem as assignment problem.

UNIT- III:

Sequencing Models: Solution of Sequencing Problem, Processing n Jobs through two machines, Processing n Jobs through three machines, Processing two Jobs through m machines, Processing n Jobs through m Machines.

Network Models: Definitions– CPM and PERT – Their Algorithms Integral Programming. Branch and Bound Algorithms - Cutting plane algorithm.

UNIT IV

Replacement Models: Replacement of Items that Deteriorate whose maintenance costs increase with time without change in the money value, Replacement of items that fail suddenly, individual replacement policy, group replacement policy.

Game Theory: Two person Zero Sum Games – Mixed strategy games and their Algorithms.

Text Books:

1. A. M. Natarajan, P. Balasubramani, A. Tamilarasi, Operations Research, Pearson Education, India, 2006.
2. S. D. Shama , Operation Research, Tata McGraw Hill, New Delhi, 2009.

Reference Books:

1. J. K. Sharma, Operations Research – Theory and Applications, 3rd edition, Macmillan India Ltd, India, 2007.
2. R. Panneerselvam, Operations Research, 2nd edition, Prentice Hall of India, India, 2008.

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(13MC306) DATABASE MANAGEMENT SYSTEMS LAB

Objectives:

- To let the student implement the basic commands of SQL and write triggers through oracle.

EXPERIMENTS LIST:

1. Data Definition, Table Creation, Constraints.
2. Insert, Select Commands, Update and Delete Commands.
3. Nested Queries and Join Queries.
4. Views.
5. High level programming language extensions (Control structures, Procedures and Functions).
6. Front end Tools.
7. Forms.
8. Triggers.
9. Menu Design.
10. Reports.
11. Database Design and implementation (Mini Project).

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(13MC307) JAVA PROGRAMMING LAB

Objectives:

- To let the student implement the various types of problems through the java programming language.

List of Sample Problems/Experiments

JAVA PROGRAMS:

1. The Fibonacci sequence is defined by the following rule:
   The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.

2. a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
   b) Write a Java program to multiply two given matrices.
   c) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use StringTokenizer class of java.util)
3. Write a Java program to illustrate method overloading.

4. Write a Java program to sort a list of names in ascending order.

5. Write a Java program to perform the following operations:
   a) Concatenation of two strings. b) Comparison of two strings.

6. Write a Java program that makes frequency count of letters in a given text.

7. Write a Java program that uses functions to perform the following Operations:
   a) Inserting a sub-string in to the given main string from a given position.
   b) Deleting n characters from a given position in a given string.

8. a) Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
   b) Write a Java program to make frequency count of words in a given text.

9 .a) Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
   b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
   c) Write a Java program that displays the number of characters, lines and words in a text file.
10. a) Develop an applet in Java that displays a simple message.
   b)Develop an applet in Java that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named “Compute” is clicked.

11. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.

12. Write a Java program for handling mouse events.

13. a) Write a Java program that creates three threads. First thread displays "Good Morning" every one second, the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every three seconds.
    b) Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

14. Write a Java program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

15. Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. (Use java.net)

16. a) Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No light is on when the program starts.
    b) Write a Java program that allows the user to draw lines, rectangles and ovals.

17. Write a Java program that illustrates the following
    a) Creation of simple package. b) Accessing a package. c) Implementing interfaces.

18. Write Java programs that illustrates the following
    a) Handling predefined exceptions b) Handling user defined exceptions

19. Write Java programs that use both recursive and non-recursive functions for implementing the following searching methods:
    a) Linear search b) Binary search

20. Write a Java program for handling Key events.

21. Write Java programs for implementing the following sorting methods:
    a) Bubble sort b) Quick sort c) Selection sort d) Insertion sort

Note: You may use packages like java.io, java.util, java.net, java.awt etc in solving the Above Java problems.

Reference Books:

1. C.Horstman , Gary Cornel, Core Java 2, Vol I, Fundamentals, 7th Edition, Pearson Education.
2. C.Horstman, Gary Cornel, Core Java 2, Vol 2, Fundamentals, 7th Edition, Pearson Education.
3. Y.Daniel Liang, Introduction to Java programming, Sixth edition, pearson Education.

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(13MC308) SEMINAR-I

Objectives: To get involved with the latest advancements and developments to enhance communication and presentation skills, exchange of ideas, greater connectivity to develop a research bent of mind.

For the seminar, the student shall collect the information on a specialized relevant topic and prepare a report, showing his understanding over the topic, and submit to the department, which shall be evaluated by the Department Committee consisting of Head of the department, Seminar Supervisor and a Senior Faculty Member. Each Seminar shall be evaluated for 100 marks with a break up of 20 marks for report, 20 for subject content, 40 for presentation and 20 for queries.

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MCA IV Semester	L	T	P	[C]
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(13MC401) COMPUTER NETWORKS

Objectives:

- Understand the basic concepts of data communications and computer networks
- Understand Internet and principles of the TCP/IP protocol suite.
- Understand LANs, Wireless LANs and WANs
- Understand the network security concepts.

UNIT- I:

Introduction to Networks, internet, protocol and standard , the OSI model, layer in OSI model, TCP/IP suite, Addressing, Analog and digital signals.
Physical Layer: digital transmission, multiplexing, transmission media, circuit switched networks, Datagram networks, virtual circuit networks, switch and Telephone network.

UNIT- II:

Data link layer: Introduction Block coding, cyclic codes,, checksum, framing, flow and error control, Noiseless channels, noisy channels, HDLC , point to point protocols
Medium Access sub layer: Random access, controlled access, channelization, IEEE standards, Ethernet, Fast Ethernet ,Giga-Bit Ethernet, wireless LANs.

UNIT- III:

Connecting LANs, backbone networks and virtual LANs, Wireless WANs, SONET, frame relay and Network Layer: Logical addressing, internetworking, tunneling, address mapping, ICMP, IGMP, Forwarding, uni-cast routing protocols, multicast routing protocols.

UNIT- IV:

Transport Layer: Process to process delivery, UDP and TCP protocols, SCTP, data traffic, congestion, Congestion control, Qos, integrated services, differentiated services ,Qos in switched networks.
Application Layer: Domain name space, DNS in internet, electronic mail, FTP, WWW, HTTP, SNMP, multi-media, network security

Text Books:

1. Behrouz A .Forouzan ,Data Communication and Networking, Fourth Edition, TMH.
2. Andrew S Tanenbaum ,Computer Network, 4th Edition, Person Education.

Reference Books:

1. S.Keshav, An Engineering Approach to Computer Network , 2nd Edition, Person Education.
2. W.A.Shay ,Understanding communication and Networks,3rd Edition, Cengage Learning.
3. N Nader, F. Mir , Computer and Communication Networks, Pearson Edition
4. James F.Kurose, K.W.Ross Computer Networking: A Top-Down Approach Featuring the Internet ,3rd Edition, Person Edition.

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(13MC402) LINUX PROGRAMMING

Objectives:

- Understand the utilities of linux and bourne shell.
- Understand linux files and process.
- Understand about linux signals, interprocess communication.
- Understand the network security concepts, sockets.

UNIT- I:

Linux Utilities: File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities, sed – scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts, operation, patterns, actions, functions, using system commands in awk.

Working with the Bourne again shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell,shell script examples, interrupt processing, functions, debugging shell scripts.

UNIT- II:

Linux Files: File Concept, File System Structure, Inodes, File types, The standard I/O (fopen, fclose, fflush, fseek, fgetc, getc, getchar, fputc, putc, putchar, fgets, gets etc.), formatted I/O, stream errors, kernel support for files, System calls, library functions, file descriptors, low level file access - usage of open, creat, read, write, close, lseek, stat family, umask, dup, dup2, fcntl, file and record locking. file and directory management - chmod, chown, links(soft links & hard links - unlink, link, symlink), mkdir, rmdir, chdir, getcwd, Scanning Directories-opendir, readdir, closedir, rewinddir, seekdir, telldir functions.

Linux Process: Process concept, Kernel support for process, process attributes, process hierarchy, process states, process composition, process control - process creation, waiting for a process, process termination, zombie process, orphan process, system call interface for process management-fork, vfork, exit, wait,
waitpid, exec family, system.

UNIT- III:

Linux Signals: Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.

Interprocess Communication: Introduction to IPC, IPC between processes on a single computer System, IPC between processes on different systems, pipes, FIFOs, Introduction to three types of IPC (Linux) - message queues, semaphores and shared memory. Message Queues- Kernel support for messages, Linux APIs for messages, client/server example. Semaphores- Kernel support for semaphores, Linux APIs for semaphores, file locking with semaphores.

Shared Memory - Kernel support for shared memory, Linux APIs for shared memory, semaphore and shared memory example.

UNIT IV

Multithreaded Programming – Differences between threads and processes, Thread structure and uses, Threads and Lightweight Processes, POSIX Thread APIs, Creating Threads, Thread Attributes, Thread Synchronization with semaphores and with Mutexes, Example programs.

Sockets: Introduction to Linux Sockets, Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs.

Text Books:

1. T. Chan ,Unix System Programming using C++, PHI.
2. Sumitabha Das ,Unix Concepts and Applications, 4th Edition, TMH, 2006.
3. N.Matthew, R.Stones, Wrox ,Beginning Linux Programming, 4th Edition, Wiley India,2008.

Reference Books:

1. O'Reilly ,Linux System Programming, Robert Love, First Edition, 2007.
2. W.R.Stevens ,Unix Network Programming, PHI.
3. Graham Glass, King Ables ,Unix for programmers and users, 3rd Edition, Pearson Education, 2003.
4. W.R.Stevens ,Advanced Programming in the Unix environment, 2nd Edition, Pearson Education.
5. A. Hoover, System Programming with C and Unix, Pearson Education.
6. Kumar Saurabh,Unix Programming, 1st Edition, Wiley India pvt Ltd.

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(13MC403) DATA WAREHOUSING AND DATA MINING

Objectives:

- Understand the basic concepts data ware house and how it is used for implementing the data mining.
- Understand about classification and clustering of data.

UNIT- I:

Introduction and Data Warehousing: Introduction, Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Implementation, Further Development, Data Warehousing to Data Mining

UNIT- II:

Data Preprocessing, Language, Architectures, Concept Description: Why Preprocessing, Cleaning, Integration, Transformation, Reduction, Discretization, Concept Hierarchy Generation, Data Mining Primitives, Query Language, Graphical User Interfaces, Architectures, Concept Description, Data Generalization, Characterizations, Class Comparisons, Descriptive Statistical Measures.

UNIT- III:

Association rules: Association Rule Mining, Single-Dimensional Boolean Association Rules from Transactional Databases, Multi-Level Association Rules from Transaction Databases.

UNIT IV

Classification And Clustering: Classification and Prediction, Issues, Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Cluster Analysis, Types of data, Categorization of methods, Partitioning methods, Outlier Analysis.
Recent Trends: Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, World Wide Web, Applications and Trends in Data Mining

Text Books:

1. J. Han, M. Kamber, “Data Mining: Concepts and Techniques”, Harcourt India / Morgan Kauffman, 2001.
2.v.pudi , p.radha Krishna ,” Data mining”, Oxford University press.

Reference Books:

1. Margaret H.Dunham, “Data Mining: Introductory and Advanced Topics”, Pearson Education 2004.
2. Sam Anahory, Dennis Murry, “Data Warehousing in the real world”, Pearson Education 2003.
3. David Hand, Heikki Manila, Padhraic Symth, “Principles of Data Mining”, PHI 2004.
4. W.H.Inmon, “Building the Data Warehouse”, 3rd Edition, Wiley, 2003.
5. Alex Bezon, Stephen J.Smith, “Data Warehousing, Data Mining & OLAP”, McGraw-Hill Edition, 2001.

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(13MC404) ARTIFICIAL INTELLIGENCE
(ELECTIVE-I)

Objectives:

- Understand the basic concepts of how problems will be solved through artificial algorithms and the history.
- To understand various logical techniques for searching and pattern design procedures.

UNIT- I:

Introduction: AI problems, foundation of AI and history of AI intelligent agents: Agents and environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

UNIT- II:

Searching: Searching for solutions, uniformed search strategies – Breadth first search, depth first Search. Search with partial information (Heuristic search) Greedy best first search, A* search Game Playing: Adversial search, Games, minimax, algorithm, optimal decisions in multiplayer games, Alpha-Beta pruning, Evaluation functions, cutting of search.

UNIT- III:

Knowledge Representation & Reasons logical Agents, Knowledge – Based Agents, the Wumpus world, logic, propositional logic, Resolution patterns in proportional logic, Resolution, Forward & Backward Chaining.

UNIT- IV:

first order logic, Inference in first order logic, propositional vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution.

Text Books:

1. Stuart Russel, Peter Norvig ,Artificial Intelligence – A Modern Approach,Second Edition, PHI/ Pearson Education.
2. E.Rich and K.Knight ,Artificial Intelligence , 2nd Edition,TMH.

Reference Books:

1. Patterson,Dan W,Artificial Intelligence and Expert Systems , PHI.

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(13MC405) HUMAN COMPUTER INTERACTION
(ELECTIVE-I)

Objectives:

- Understand the basic concepts graphical user interface.
- Understand the design process and screen designing guidelines for user interface.
- Understand how to design windows, screens, software tools.

UNIT- I:

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

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

UNIT- II:

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

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

UNIT- III:

Windows: New and Navigation schemes selection of window, selection of devices based and screen based controls.

Components: Text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT- IV:

Software Tools: Specification methods, interface – Building Tools.

Interaction Devices: Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

Text Books:

1. Wilbert O Galitz, The essential guide to user interface design, Wiley Dream Tech.
2. Ben Shneidermann, Designing the user interface,3rd Edition, Pearson Education, Asia.

Reference Books:

1. Alan Dix, Janet Fincay, Gre Goryd, Abowd, Russell Bealg, Human – Computer Interaction, Pearson.
2. PRECE, ROGERS, SHARPS Interaction Design, Wiley Dream tech,
3. Soren Lauesen, User Interface Design, Pearson Education.
4. D.R.Olsen, Human–Computer Interaction, Cengage Learning.

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(13MC406) DESIGN PATTERNS
(ELECTIVE-I)

Objectives:

- Understand the basic concepts various design patterns and importance of it.
- Understand how to implement various design patterns and its behaviors on an application through a case study.

UNIT- I:

Introduction: What Is a Design Pattern? Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT- II:

A Case Study: Designing a Document Editor: Design Problems, Document Structure, Formatting, Embellishing the User Interface, and Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary.
Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT- III:

Structural Pattern Part-I: Adapter, Bridge, and Composite.
Structural Pattern Part-II: Decorator, Facade, Flyweight, Proxy.

UNIT- IV:

Behavioral Patterns Part-I: Chain of Responsibility, Command, Interpreter, and Iterator.
Behavioral Patterns Part-II: Mediator, Memento, Observer.
Behavioral Patterns Part-III (cont'd): State, Strategy, Template Method, Visitor, and Discussion of Behavioral Patterns.

Text Books:

1. Erich Gamma, Design Patterns, Pearson Education.
2. Eric Freeman-Oreilly-spd , Head First Design Patterns.

Reference Books:

1. Mark Grand , Pattern's in JAVA Vol-I, Wiley DreamTech.
2. Mark Grand , Pattern's in JAVA Vol-II ,Wiley DreamTech.
3. Mark Grand , JAVA Enterprise Design Patterns Vol-III , Wiley DreamTech.

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(13MC407) COMPUTER GRAPHICS
(ELECTIVE-II)

Objectives:

- Understand the basic concepts of data communications and computer networks
- Understand Internet and principles of the TCP/IP protocol suite.
- Understand LANs, Wireless LANs and WANs

UNIT- I:

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, and raster-scan systems, random scan systems, graphics monitors and work stations and input devices ,Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT- II:

2-D Geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland – Hodgeman polygon clipping algorithm.

UNIT- III:

3-D Object representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-spline curves, Bezier and B-spline surfaces. Basic illumination models, polygon rendering methods.

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations, 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

UNIT- IV:

Visible surface detection methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods.

Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

Text Books:

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

2. Foley, Van Dam, Feiner and Hughes, "Computer Graphics Principles & practice", second edition in C, Pearson Education.

Reference Books:

1. Zhigand xiang, Roy Plastock, "Computer Graphics Second edition", Schaum's outlines, Tata Mc Graw hill edition.

2. David F Rogers, "Procedural elements for Computer Graphics", Tata Mc Graw hill, 2nd edition.

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(13MC408) NEURAL NETWORKS AND FUZZY SYSTEMS
(ELECTIVE-II)

Objectives

- Understand the concepts of Neural Networks and Fuzzy Systems.
- To understand how genetic algorithms and hybrid systems are implemented using neural networks and fuzzy systems.

UNIT- I:

Fuzzy Logic: Crisp set and Fuzzy set, basic concepts of fuzzy sets, membership functions. Basic operations on fuzzy sets, Properties of fuzzy sets, Fuzzy relations. Propositional logic and Predicate logic, fuzzy If – Then rules, fuzzy mapping rules and fuzzy implication functions, Applications.

UNIT- II:

Neural Networks: Basic concepts of neural networks, Neural network architectures, Learning methods, Architecture of a back propagation network, Applications.

UNIT- III:

Genetic Algorithms: Basic concepts of genetic algorithms, encoding, genetic modeling.

UNIT- IV:

Hybrid Systems: Integration of neural networks, fuzzy logic and genetic algorithms.

Text Books:

1. S. Rajasekaran and G.A.Vijaylakshmi Pai.. Neural Networks Fuzzy Logic, and Genetic Algorithms, Prentice Hall of India.
2. K.H.Lee., First Course on Fuzzy Theory and Applications, Springer-Verlag.

Reference Books:

1. J. Yen and R. Langari, Fuzzy Logic, Intelligence, Control and Information, Pearson Education.

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MCA IV Semester

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(13MC409) DISTRIBUTED SYSTEMS
(ELECTIVE-II)

Objectives:

- Understand the concepts of Architecture and Characterization of Distributed Systems.
- To understand Inter process Communication and Object Remote Invocation.
- To understand the transaction management and concurrency control in distributed environment.

UNIT- I:

Classes Characterization of Distributed Systems: Introduction, Examples of distributed systems, Resource sharing and the Web, Challenges.

System models: Introduction, Architectural models, Fundamental models.

Networking and Internetworking: - Introduction, Types of network, Network principles, Internet protocols, Network case studies: Ethernet, Wireless LAN and ATM.

UNIT- II:

Classes Interprocess communication: Introduction, The API for the Internet protocols, External data representation and marshalling, Client-server communication, Group communication, Case study: Interprocess communication in UNIX.

Distributed Objects and Remote Invocation: Introduction, Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study.

UNIT- III:

Classes Distributed File Systems: Introduction, File service architecture, Sun Network file system, The Andrew File System, Recent advances.

Name Services: Introduction, Name services and the Domain Name System, Directory and discovery services, Case study of the Global Name Service.

Time and Global States: Introduction, Clocks, events and process states, Synchronizing physical clocks, Logical time and logical clocks, Global states.

UNIT- IV:

Classes Coordination and Agreement: Introduction, Distributed mutual exclusion, Elections, Multicast communication.

Transactions and Concurrency Control: Introduction, Transactions, Nested transactions, Locks, Optimistic concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

Classes Distributed Transactions: Introduction, Flat and nested distributed transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.

Replication: Introduction, system model and group communication, Transactions with replicated data.

Text Books:

1. George Coulouris, Jean Dollimore, Tim Kindberg, Distributed Systems – Concepts and Design, Pearson Education.

Reference Books:

1. Andrew S. TenenBaum, and Marten Van Steen, Distributed Systems – Principles & Paradigms, Pearson Education.
2. Pradeep Sinha, Distributed Operating Systems, PHI

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(13MC410) LINUX PROGRAMMING LAB

Objectives:

- To make the student implement the shell programming functionality using C language in Linux operating system and to implement various commands of unix.

EXPERIMENTS LIST:

1. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
2. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
3. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
4. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
6. Write a shell script to list all of the directory files in a directory.
7. Write a shell script to find factorial of a given integer.
8. Write an awk script to count the number of lines in a file that do not contain vowels.
9. Write an awk script to find the number of characters, words and lines in a file.
10. Write a c program that makes a copy of a file using standard I/O and system calls.
11. Implement in C the following Unix commands using System calls
    A . cat B. ls C. mv
12. Write a program that takes one or more file/directory names as command line input and reports the following information on the file.
    A. File type. B. Number of links. C. Time of last access.D. Read, Write and Execute permissions.
13. Write a C program to emulate the Unix ls –l command.
14. Write a C program to list for every file in a directory, its inode number and file name.
15. Write a C program that demonstrates redirection of standard output to a file. Ex: ls > f1.
16. Write a C program to create a child process and allow the parent to display “parent” and the child to display “child” on the screen.
17. Write a C program to create a Zombie process.
18. Write a C program that illustrates how an orphan is created.
19. Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex:- ls –l | sort
20. Write C programs that illustrate communication between two unrelated processes using named pipe.
21. Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
22. Write a C program (receiver.c) that receives the messages (from the above message queue as specified in (21)) and displays them.

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(13MC411) DATA WAREHOUSING AND DATA MINING LAB

Objective:

The objective of the lab exercises is to use data mining techniques to identify customer segments and understand their buying behavior and to use standard databases available to understand DM processes using WEKA (or any other DM tool)

EXPERIMENTS LIST:

1. Gain insight for running pre- defined decision trees and explore results using MS OLAP Analytics.

2. Using IBM OLAP Miner – Understand the use of data mining for evaluating the content of multidimensional cubes.

3. Using Teradata Warehouse Miner – Create mining models that are executed in SQL.
(BI Portal Lab: The objective of the lab exercises is to integrate pre-built reports into a portal application)

4. Publish cognos cubes to a business intelligence portal. Metadata & ETL Lab: The objective of the lab exercises is to implement metadata import agents to pull metadata from leading business intelligence tools and populate a metadata repository. To understand ETL processes

5. Import metadata from specific business intelligence tools and populate a meta data repository.

6. Publish metadata stored in the repository.

7. Load data from heterogeneous sources including text files into a pre-defined warehouse schema.

Case study

8. Design a data mart from scratch to store the credit history of customers of a bank. Use this credit profiling to process future loan applications.

9. Design and build a Data Warehouse using bottom up approach titled 'Citizen Information System'. This should be able to serve the analytical needs of the various government departments and also provide a global integrated view.

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(13MC412) QUALITATIVE AND QUANTITATIVE ANALYSIS

Objectives: To determine and measure the one's ability thorough advanced training, some specific set of skills (intellectual, motor and so on), the subject assumes that professional potential and special abilities developed.

Unit – I:

Simple Arithmetic -Number - H.C.F. & L.C.M. of Numbers – Decimal Fractions – Simplification – Square Root and Cube Root – Average – Problems on Numbers – Problems on Ages – Percentage – Profit & Loss – Ratio & Proportion-Partnership – Chain Rule – Time & Work – Pipes & Cisterns – Time & Distance – Problems on Trains – Boats & Streams – Allegation or Mixture – Simple Interest – Compound Interest – Area Volume & Surface Areas – Volume & Surface Areas – Calendar – Clocks – Races & Games of Skill – Number Series – Tabulation – Pi –Chart – Bar Diagram – Line Graphs.

Unit – II:

Reasoning (Verbal and Non-Verbal) -Series Completion – Analogy – Coding–Decoding – Classification – Blood Relations – Puzzle test – Sequential output tracing - Direction Sense test – Logical Venn diagrams – Alphabet test – Alpha-Numeric Sequence puzzle – Number, Ranking and time sequence test – Mathematical operations – Logical sequence of words – Arithmetical reasoning – Insert the missing character – Data sufficiency – Eligibility test – Assertion and reason – Situation reaction test – Verification of Truth of the Statement - –Cubes and dice.

Unit – III:

Logical deductions, Non verbal reasoning

Logic – Statement-Arguments – Statement-Assumptions – Statement-Course of action – Statement-Conclusions – Deriving conclusion from passages – Theme deduction – Cause and effect reasoning

UNIT – IV:

Reading Comprehension- Purpose of reading, reading rates, improving comprehension skills, techniques for good comprehension, skimming, scanning, determining the meaning of words, different styles of worked out problems.

Text Books:

1. RS Agarwal , A textbook on Quantitative Aptitude.
2. RS Agarwal, A textbook on verbal and nonverbal reasoning .
3. Meenakshi Raman and Sangeeth Sarma, Technical Communication.

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MCA V Semester

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(13MC501) OBJECT ORIENTED SYSTEMS DEVELOPMENT

Objectives:

- Understand the importance of UML in Modeling.
- Understand the classes, relationships and various model diagrams.

UNIT- I:

Introduction to UML: Object, Object Orientation, Development, Modeling, Object Modeling, Importance of Modeling, Principles of Modeling, Conceptual model, Model Driven Architecture with UML, Software Development Life Cycle of UML, UML Architecture.

UNIT- II:

Basic Structural Modeling: Classes, Relationships, Diagrams.

Advanced structural Modeling: Advanced Classes, Advanced relations, Interfaces, Types and Roles.

Class & Object diagrams: Terms, Concepts, Common Modeling techniques for Class & Object diagrams.

UNIT- III:

Basic Behavioral Modeling –I: Interactions, Interaction diagrams, Common Modeling techniques

Basic Behavioral Modeling –II: Use Cases, Use Case Diagrams, and Activity Diagrams, Common Modeling techniques.

UNIT- IV:

Advanced Behavioral Modeling: Events and Signals, State machines, State chart diagrams.

Architectural Modeling: Component, Development, Component Diagrams, and Deployment Diagrams. Patterns and Frameworks, Artifact Diagrams. Case Study: The Unified Library application

Text Books:

1. Grady Booch, James Rambaugh, Ivar Jacobson: The Unified Modeling Language User Guide, Pearson Education.
2. Simon, Object Oriented Analysis and Design Bennett, McGraw Hill

Reference Books:

1. Craig Larman," Applying UML and Patterns- An Introduction to Object oriented Analysis and Design and Iterative Development", 3rd Edition, Pearson Education.
2. HansEriksson, Magnus, Penker, BrainLyons, DavidFado:UML2Toolkit, WILEY Dreamtech India Pvt.Ltd
3.Meilir , Page-Jones:Fundamentals of Object Oriented Design in UML,Pearson education
4.Atul Kahate, Object Oriented and Design,The McGraw-Hill Company.

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(13MC502) WEB TECHNOLOGIES

Objectives:

- Understand how to develop html, xml scripts to develop static web pages.
- Understand the architecture of java beans.
- Understand the characterization of web servers and clients.
- Understand how to access the data from data base through the java programs.

UNIT- I:

HTML Common tags - List, Tables, images, forms, Frames; Cascading Style sheets.
Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script
XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

UNIT- II:

Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK, Introspection, Using Bound properties, Bean Info Interface, Constrained properties, Persistence, Customizes, Java Beans API, Introduction to EJB's.
Web Servers and Servlets: Tomcat web server, **Introduction** to servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servlet Package, Reading Servlet parameters, and Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

UNIT- III:

Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat
JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations.

UNIT- IV:

Database Access: Database Programming using JDBC, Studying Javax.sql.* package, Accessing a Database from a JSP Page, Application – Specific Database Actions, Deploying JAVA Beans in a JSP Page, Introduction to struts framework.

Text Books:

1. Chris Bates ,Web Programming, building internet applications, 2nd edition, WILEY Dreamtech
2. Herbert Schildt ,The complete Reference Java Seventh Edition, TMH.
3. Hans Bergsten, SPD O'Reilly ,Java Server Pages

Reference Books:

1. web-Sebesta, Programming world wide, Pearson
2. Dietel and Nieto ,Internet and World Wide Web – How to program, PHI/Pearson Education Asia.
3. Bill Siggelkow, S P D O'Reilly ,Jakarta Struts Cookbook.

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MCA V Semester	L	T	P	[C]
	4	0	0	[4]

(13MC503) SOFTWARE TESTING METHODOLOGIES

Objectives:

- Understand Flow graphs and Path Testing.
- Understand Transaction Flow Testing and Domain Testing.
- Understand Logic based testing.
- Understand state graphs, transition testing.

UNIT- I:

Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.

Flow graphs and Path testing : Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT- II:

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

Domain Testing: Domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

UNIT-III:

Paths, Path products and Regular expressions: Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

Logic Based Testing: Overview, decision tables, path expressions, kv charts, specifications.

UNIT-IV:

State, State Graphs and Transition testing: State graphs, good & bad state graphs, state testing, Testability tips.

Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.

Text Books:

1. Baris Beizer ,Software testing techniques , second edition, Dreamtech.
2. Dr.K.V.K.K.Prasad ,Software Testing Tools , Dreamtech.

Reference Books:

1. Brian Marick ,The craft of software testing , Pearson Education.
2. Edward Kit, Software Testing in the Real World ,Pearson.
3. Perry, John Wiley, Effective methods of Software Testing.
4. Meyers, John Wiley ,Art of Software Testing .

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MCA V Semester	L	T	P	[C]
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(13MC504) CLOUD COMPUTING
(ELECTIVE-III)

Objectives:

- Understand the cloud computing platforms around us and virtualization technology.
- Understand organization of data in the cloud.
- Understand the cloud computing security architecture and challenges.

UNIT- I:

Introduction to Cloud Computing, Definition, Characteristics, Components, Cloud provider, SAAS, PAAS, IAAS and Others, Organizational scenarios of clouds, Administering & Monitoring cloud services, benefits and limitations, Deploy application over cloud, Comparison among SAAS, PAAS, IAAS

Cloud computing platforms: Infrastructure as service: Amazon EC2,Platform as Service: Google App Engine, Microsoft Azure, Utility Computing, Elastic Computing Introduction to Cloud Technologies, Study of Hypervisors Compare SOAP and REST.

Web services, AJAX and mashups-Web services: SOAP and REST, SOAP versus REST, AJAX: asynchronous 'rich' interfaces, Mashups: user interface services

Virtualization Technology: Virtual machine technology, virtualization applications in enterprises, Pitfalls of virtualization

Multitenant software: Multi-entity support, Multi-schema approach, Multitenance using cloud data stores, Data access control for enterprise applications

UNIT- II:

Data in the cloud: Relational databases, Cloud file systems: GFS and HDFS, BigTable, HBase and Dynamo.

Map-Reduce and extensions: Parallel computing, The map-Reduce model, Parallel efficiency of Map-Reduce, Relational operations using Map-Reduce, Enterprise batch processing using Map-Reduce, Introduction to cloud development, Example/Application of Map reduce, Features and comparisons among GFS,HDFS etc, Map-Reduce model

UNIT- III:

Cloud security fundamentals: Vulnerability assessment tool for cloud, Privacy and Security in cloud.

Cloud computing security architecture: Architectural Considerations- General Issues, Trusted Cloud computing, Secure Execution Environments and Communications, Micro-architectures; Identity Management and Access control Identity management, Access control, Autonomic Security.

UNIT- IV:

Cloud computing security challenges: Virtualization security management-virtual threats, VM Security Recommendations, VM-Specific Security techniques, Secure Execution Environments and Communications in cloud. Cloud computing platforms, Installing cloud platforms and performance evaluation Features and functions of cloud platforms: Xen Cloud Platform, Eucalyptus, Open Nebula, Nimbus, TPlatform, Apache Virtual Computing Lab (VCL), and Enomaly Elastic Computing Platform.

Text Books:

1. Judith Hurwitz, R.Bloor, M.Kanfman, F.Halper ,Cloud Computing for Dummies , Wiley India Edition
2. Gautam Shroff, Enterprise Cloud Computing , Cambridge
3. Ronald Krutz and Russell Dean Vines, Cloud Security ,Wiley-India

Reference Books:

1. Scott Granneman, Google Apps ,Pearson
2. Tim Malhar, S.Kumaraswammy, S.Latif ,Cloud Security & Privacy ,SPD,O'REILLY.
3. Antohy T Velte et.al., Cloud Computing : A Practical Approach, McGraw Hill,
4. Barrie Sosinsky, Cloud Computing Bible ,Wiley India
5. Stefano Ferretti et.al.,QoS–aware Clouds, 2010 ,IEEE 3rd International Conference on Cloud Computing

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MCA V Semester	L	T	P	[C]
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(13MC505) CRYPTOGRAPHY AND NETWORK SECURITY
(ELECTIVE-III)

Objectives:

- Understand various cryptographic algorithms.
- Understand public –key cryptosystem.
- Understand the fundamental ideas of public-key cryptography.
- Discuss Web security and Firewalls

UNIT-I:

Attacks on Computers and Computer Security: Introduction, the need for security, security approaches, principles of security, types of security attacks, security services, security mechanisms, a model for network security. 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- II:

Symmetric Key Ciphers: Block cipher principles and algorithms (DES, AES, BlowFish), Differential and Linear Cryptanalysis, Block cipher modes of operation, stream ciphers, RC4, Location and placement of encryption function, key distribution. Asymmetric key ciphers: principles of public key cryptosystems, algorithms (RSA, Diffie-Hellman, ECC), key distribution.

UNIT- III:

Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions message authentication codes, hash functions, secure hash algorithm, whirlpool, HMAC, CMAC, Digital Signatures, Knapsack Algorithm. Authentication Applications: Kerberos, X.509 authentication service, Public, key infrastructure, biometric authentication.

UNIT- IV:

E-mail Security: pretty good privacy, S/MIME IP Security: IP Security overview, IP Security architecture, authentication header, encapsulating security payload, combining security associations, key management. **Web Security**: Web security considerations, secure socket layer and transport layer security, secure electronic transaction intruders, Virus and Firewalls: Intruders, Intrusion detection, password management, virus and related threats, counter measures, firewall design principles, types of firewalls, **Case Studies on Cryptography and Security**: secure inter branch payment transactions, cross site scripting vulnerability, virtual elections.

Text Books:

1. William Stallings ,Cryptography and Network Security, 4th Edition ,Pearson Education.
2. Atul Kahate, Cryptography and Network Security, 2nd Edition ,Mc Graw Hill,.

Reference Books:

1. WM. Arthur Conklin, Greg White, Principles of Computer Security, TMH.
2. Bernard Menezes, Network Security and Cryptography, CENGAGE Learning.

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(13MC506) E-COMMERCE
(ELECTIVE-III)

Objectives:

- Understand the common framework of E-commerce applications.
- Understand Electronic payment systems.
- Understand consumer searching and resource discovery in multimedia.

UNIT- I:

Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications. Consumer Oriented Electronic commerce - Mercantile Process models.

UNIT -II:

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

Inter Organizational Commerce - EDI, EDI Implementation, Value added networks.

Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT- III:

Corporate Digital Library - Document Library, digital Document types, corporate Data Warehouses.

Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT- IV:

Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering.

Multimedia - key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing, Desktop video conferencing.

Text Books:

1. Whinston, Frontiers of electronic commerce ,Kalakata, Pearson.
2. Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley ,E-Commerce fundamentals and applications.

Reference Books:

1. S.Jaiswal, Galgotia, E-Commerce.
2. Efrain Turbon, Jae Lee, David King, H.Michael Chang ,E-Commerce.
3. Gary P.Schneider ,Electronic Commerce ,Cengage Learning.

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(13MC507) MOBILE APPLICATION DEVELOPMENT
(ELECTIVE-IV)

Objectives:

- Understand the environment of small computing technology.
- Understand various J2ME architecture and development environment.
- Understand JDBC objects in J2ME and Embedded SQL.

UNIT- I:

J2ME Overview -Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices
Small Computing Technology: Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants
J2ME Architecture and Development Environment- J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit.
J2ME Best Practices and Patterns*:* The Reality of Working in a J2ME World, Best Practices
Commands, Items, and Event Processing: J2ME User Interfaces, Display Class, The Palm OS Emulator, Command Class, Item Class, Exception Handling

UNIT- II:

High-Level Display Screens: Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class
Low-Level Display Canvas: The Canvas, User Interactions, Graphics, Clipping Regions, Animation

UNIT- III:

Record Management System- Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener.
JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects, Result set, Transaction Processing, Metadata, Data Types, Exceptions.

UNIT- IV:

JDBC and Embedded SQL: Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data form a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Sub queries, VIEWs.
Generic Connection Framework: The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process.

Text Books:

1. James Keogh, J2ME: The Complete Reference, Tata McGraw-Hill.
2. Michael Juntao Yuan, Enterprise J2ME: Developing Mobile Java Applications ,Pearson Education, 2004

Reference Books:

1. Ray Rischpater, Beginning Java ME Platform, Apress, 2009
2. Sing Li, Jonathan B. Knudsen ,Beginning J2ME: From Novice to Professional, Third Edition, Apress, 2005

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(13MC508) INFORMATION RETRIEVAL SYSTEMS
(ELECTIVE-IV)

Objectives:

On completion of this course you should have gained a good understanding of the foundation concepts of information retrieval techniques and be able to apply to apply these concepts into practice. Specifically, you should be able to:

- Use different information retrieval techniques in various application areas
- Apply IR principles to locate relevant information from large collections of data
- Implement retrieval systems for web search tasks.

UNIT- I:

Boolean retrieval .The term vocabulary and postings lists. Dictionaries and tolerant retrieval. Index Construction, Index compression

UNIT- II:

Scoring term weighting and the vector space model. Computing scores in a complete search system. Evaluation in information retrieval. Relevance feedback and query expansion.

UNIT- III:

XML retrieval. Probabilistic information retrieval. Language models for information retrieval. Text Classification . Vector space classification.

UNIT – IV:

Support vector machines and machine learning on documents. Flat clustering. Hierarchical clustering. Matrix decompositions and latent semantic indexing. Web search basic. Web crawling and indexes. Link analysis.

Text Books:

1. Christopher D.Manning and Prabhakar Raghavan and Hinrich Schutze, Introduction to Information Retrieval, Cambridge University Press,2008.

Reference Books:

1. Kowalski, Gerald, Mark T Maybury ,Information Storage and Retrieval System: Theory and Implementation, Springer
2. Ricardo Baeza-Yates, Modern Information Retrieval , Pearson Education,2007.
3. David A Grossman and Ophir Frieder ,Information Retrieval: Algorithms and Heuristics, 2nd Edition, Springer,2004

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(13MC509) SOFTWARE PROJECT MANAGEMENT
(ELECTIVE-IV)

Objectives:

- Understand the importance of conventional software management.
- Understand life cycle phases and artifacts of the process.
- Understand the project organizational responsibilities.
- Understand project control and process instrumentation.
- Understand tailoring the process and estimate future software Project management.

UNIT- I:

Conventional Software Management: Waterfall model, Conventional Software Management performance.

Evolution of Software Economics: Software economics, Pragmatic software cost estimation.

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections

The Old way and the new: The principles of conventional software Engineering, Principles of modern software management, transitioning to an iterative process.

UNIT- II:

Life cycle phases: Engineering and Production stages, Inception, Elaboration, Construction, Transition phases.

Artifacts of the process: The Artifact sets, Management artifacts, Engineering artifacts, Programmatic artifacts.

UNIT- III:

Model based software architectures: A Management perspective and technical perspective.

Work Flows of the process: Software process workflows, Iteration workflows.

Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments.

Iterative Process Planning: Work breakdown structures, Planning guidelines, Cost and Schedule estimating, Iteration planning process, Pragmatic planning

UNIT- IV:

Project Organization and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation: Automation Building blocks, The Project Environment.

Project Control and Process instrumentation: The seven core Metrics, Management indicators, Quality indicators, Life cycle exceptions, Pragmatic Software Metrics, Metrics automation

Tailoring the Process: Process discriminants.

Future Software Project Management: Modern Project Profile, Next generation Software economics, Modern process transitions.

Text Books:

1. Walker Royce, Software Project Management, Pearson Education, 2005.
2. Joel Henry, Software Project Management, Pearson Education.

Reference Books:

1.Walker Royce, Bob Hughes and Mike Cotterell , Software Project Management, Tata McGraw-Hill Edition.
2.Pankaj Jalote, Software Project Management in practice, Pearson Education 2005

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(13MC510) OBJECT ORIENTED SYSTEMS DEVELIOMENT (USING UML) LAB

Objectives:

To implement the UML diagrams for various domains of applications of software and make the student to design any type of application through UML.

Draw the UML diagrams for the following Applications:

1) Quiz Application
2) ATM Application
3) Online Railway Reservation System
4) Student Marks Analysis Application
5) Bank Simulated Company Application
6) Auction Application
7) E-Clinic Application
8) Point Of Sale Application
9) E- seva Application
10) Note Management System Application
11) Online Student Course Application
12) Corporate Recruitment System Application
13) Library System Application

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(13MC511) WEB TECHNOLOGIES LAB

Objective: To create a fully functional website with mvc architecture. To develop an online Book store using we can sell books (Ex amazon .com).

Hardware and Software required:

1. A working computer system with either Windows or Linux
2. A web browser either IE or Firefox
3. Tomcat web server and Apache web server
4. XML editor like Altova Xml-spy [www.Altova.com/**XML**Spy – free] , Stylus studio , etc.,
5. A database either Mysql or Oracle
6. JVM(Java virtual machine) must be installed on your system
7. BDK(Bean development kit) must be also be installed

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

1) **HOME PAGE:**

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

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

Left frame : At least four links for navigation, which will display the catalogue of respective links. For e.g.: When you click the link **"CSE"** the catalogue for **CSE** Books should be displayed in the Right frame.

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

<table>
<tr><td>Logo</td><td colspan="4">Web Site Name</td></tr>
<tr><td>Home</td><td>Login</td><td>Registration</td><td>Catalogue</td><td>Cart</td></tr>
<tr><td>CSE
ECE
EEE
CIVIL</td><td colspan="4">Description of the Web Site</td></tr>
</table>

2) LOGIN PAGE:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Login : Password: Submit Reset			

This page looks like below:

3) CATOLOGUE PAGE:

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

The details should contain the following:

Snap shot of Cover Page.
Author Name.
Publisher.
Price.
Add to cart button.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	   	Book : XML Bible Author : Winston Publication : Wiely Book : AI Author : S.Russel Publication : Princeton hall Book : Java 2 Author : Watson Publication : BPB publications Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	$ 40.5 $ 63 $ 35.5 $ 50	Add to cart Add to cart Add to cart Add to cart

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

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	**Book name** Java 2 XML bible	**Price** $35.5 $40.5	**Quantity** 2 1	**Amount** $70 $40.5
			Total amount -	$130.5

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

1) Name (Text field)
2) Password (password field)
3) E-mail id (text field)
4) Phone number (text field)
5) Sex (radio button)
6) Date of birth (3 select boxes)
7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
8) Address (text area)

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

1. Name (Name should contains alphabets and the length should not be less than 6 characters).
2. Password (Password should not be less than 6 characters length).
3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
4. Phone number (Phone number should contain 10 digits only).

Note : validation of the login page can also be done with these parameters.

III) Design a web page using CSS (Cascading Style Sheets) which includes the following:

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

For example:

```
<HTML>
<HEAD>
<style type="text/css">
B.headline {color:red; font-size:22px; font-family:arial; text-
decoration:underline}
</style>

</HEAD>
```

```
<BODY>
<b>This is normal bold</b><br>
Selector {cursor:value}

For example:

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

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

<b class="headline">This is headline style bold</b>
</BODY>

</HTML>
```

2) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:

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

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

As background-repeat: repeat

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

4) Define styles for links as

A: link

A: visited

A: active

A: hover

Example:

<style type="text/css">

A: link {text-decoration: none}

```
A: visited {text-decoration: none}
A: active {text-decoration: none}
A: over {text-decoration: underline; color: red ;}
</style>
```

5) Work with layers:

For example:

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

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

6) Add a customized cursor:

Selector {cursor:value}

For example:

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

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

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

1) Title of the book
2) Author Name
3) ISBN number
4) Publisher name
5) Edition
6) Price

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

Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.
Use XML schemas XSL and CSS for the above purpose.
Note: Give at least for 4 books. It should be valid syntactically.
Hint: You can use some xml editors like XML-spy

V) VISUAL BEANS:
Create a simple visual bean with a area filled with a color.
The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false.
The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the "property window ".

VI) Install TOMCAT web server and APACHE.

While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port.

1) Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root. Access the pages by using the urls : http://localhost:4040/rama/books.html (for tomcat) http://localhost:8080/books.html (for Apache)

VII) User Authentication:

Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servelet for doing the following.
1. Create a Cookie and add these four user ids and passwords to this Cookie.
2. Read the user id and passwords entered in the Login form and authenticate with the values (user id and passwords) available in the cookies.
If he is a valid user (i.e., user-name and password match) you should welcome him by name (user-name) else you should display "You are not an authenticated user ".
Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters () method.

VIII) Install a database (Mysql or Oracle).

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

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

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

IX) Write a JSP which does the following job:

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

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

XI) HTTP is a stateless protocol. Session is required to maintain the state.

The user may add some items to cart from the catalog page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time (i.e., from different systems in the LAN using the ip-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated (by using the method session.invalidate ()).Modify your catalogue and cart JSP pages to achieve the above mentioned functionality using sessions.

Reference Books:

1. Bayross and others, O'reilly,SPD ,Java Server Programming for Professionals, 2nd Edition, 2007.
2. Black Book, K. Santosh Kumar ,JDBC, Servlets, and JSP, dreamtech.
3. M.Hall and L.Brown ,Core Web Programming, 2nd Edition, Volume 1, PHPTR.
4. M.Hall and L.Brown ,Core Web Programming, 2nd Edition, Volume 2, PHPTR.
5. Horstman and Cornell ,Core Java, Volume 1, 8th Edition, Pearson Education, 2008.
6. Horstman and Cornell ,Core Java, Volume 2, , 8th Edition, Pearson Education, 2008.
7. J.Wiggles worth and P.McMillan,Thomson,Java Programming: Advanced Topics, 3rd Edition, , 2007.
8. SPD.S.Shah & V.Shah,The X Team ,Struts 2 for Beginners, 2nd edition .

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(13MC512) SEMINAR-II

Objectives: To get involved with the latest advancements and developments to enhance communication and presentation skills, exchange of ideas, greater connectivity to develop a research bent of mind.

For the seminar, the student shall collect the information on a specialized relevant topic and prepare a report, showing his understanding over the topic, and submit to the department, which shall be evaluated by the Department Committee consisting of Head of the department, Seminar Supervisor and a Senior Faculty Member. Each Seminar shall be evaluated for 100 marks with a break up of 20 marks for report, 20 for subject content, 40 for presentation and 20 for queries.

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR
(AUTONOMOUS)

MCA VI Semester	L	T	P	[C]
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(13MC601) PROJECT WORK

Students are required to take up a project work, in which the student can choose any specific problem of Industry or Industry based project work. Alternatively it can be secondary source based or Field based project work. Before the commencement of the project work each student is required to submit a synopsis indicating the objectives, Methodology, Framework for analysis, Action plan with milestones in order to have clarity for the subsequent work. The project should have an internal faculty as guide. The student can initiate the project work in the penultimate semester of the course.