SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

(**Affiliated to J.N.T. University Anantapur, Anantapur).**

ACADEMIC REGULATIONS

B.Tech. Regular Four Year Degree Program

(For the batches admitted from the academic year 2012-13)

And

B.Tech. (Lateral Entry Scheme)

(For the batches admitted from the academic year 2013-14)

1. Applicability : All the rules specified herein, approved by the Academic Council, Will be in force and applicable to students admitted from the academic year 2012-2013 onwards. Any reference to "College" in these rules and regulations stands for Sri Venkateswara College of Engineering and Technology (Autonomous).

2. Extent: : All the rules and regulations, specified herein after shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, Principal, Sri Venkateswara College of Engineering and Technology shall be the Chairman, of the Academic Council.

3. Admission :

3.1 Admission in to first year of Four Year B.Tech Degree Program of study in Engineering:

3.1.1 Eligibility : A candidate seeking admission into the first year of Four year B.Tech Degree Program should have

Passed either Intermediate Public Examination conducted by the Board of Intermediate Education, Andhra Pradesh, with Mathematics, Physics and Chemistry as optional subjects (or any equivalent examination recognized by Board of Intermediate Education and JNTU Anantapur) or a Diploma in Engineering in the relevant branch conducted by the Board of Technical Education, Andhra Pradesh (or equivalent Diploma recognized by State Board of Technical Education, govt. of A.P and JNTU Anantapur) for admission.

3.1.2 Admission Procedure : As per the existing stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made into the first year of Four year B.Tech. Degree Program as follows:

A – Category & B – Category seats are filled as per the norms prescribed by the Govt. of A.P. from time to time.

3.2 Admission into the second year of Four Year B.Tech. Degree Program in Engineering:

3.2.1 Eligibility : Candidates qualified in ECET (FDH) and admitted by the Convener, ECET (FDH).

In all such cases for admission, when needed, Permissions from the statutory bodies are to be obtained.

3.2.2 Admission Procedure : Lateral Entry seats are filled as per the norms prescribed by the Govt. of A.P. from time to time.

4. Programs of study offered leading to the award of B.Tech degree

1. B.Tech (Civil Engineering)
2. B.Tech (Computer Science & Engineering)
3. B.Tech (Electrical & Electronics Engineering)
4. B.Tech (Electronics & Communication Engineering)
5. B.Tech (Information Technology)
6. B.Tech (Mechanical Engineering)

5. Academic Year : The College shall follow Yearly Pattern for first year course and semester pattern from second year onwards.

The first year of Four year B.Tech Program shall have a minimum of 32 instructional weeks. From second year onwards each semester shall have a minimum of 16 instructional weeks.

6. Course Structure : Each Program of study shall consist of:

- **General subjects comprising of the following: (5 to 10%)**
  i. English Language /Communication Skills / Mind Skills
  ii. Humanities and Social Sciences
  iii. Economics
  iv. Principles of Management

  The above courses are common to all Branches.

- **Basic science subjects comprising of the following: (15 to 25%)**
  i. Computer Literacy with Numerical Analysis
  ii. Mathematics
  iii. Physics
  iv. Chemistry

  The above courses are common to all branches.

- **Basic Engineering subjects comprising some of the following, depending upon the branch: (15 to 25%)**
  i. Engineering Drawing
  ii. Engineering & IT workshop
  iii. Engineering Mechanics
  iv. Basic Mechanical Engineering
  v. Electrical & Electronics Engineering
  vi. Computer Programming

- **Core Subjects: (45 to 55%)**

  The list of professional subjects are chosen as per the suggestions of the experts to impart broad based knowledge needed in the concerned branch of study.

- **Elective subjects: (10 to 15%)**

  Electives will be offered to the students to diversify the spectrum of knowledge. These electives can also be chosen from outside the main discipline, based on the interest of the student to broaden his individual skill and knowledge.

The students shall complete:

A mini project in an industry during the summer term following the second semester of third year B. Tech Program for a period of 4 weeks. A report shall be submitted to Department after successful completion of the mini project, during IV year I semester.

A Main project in the institution / industry during IV year II semester for a period of one semester. A report shall be submitted to the department after successful completion of the main project.

7. Credit System : Credits are assigned based on the following norms.

Subject	Yearly Pattern		Semester Pattern	
	Periods / Week	**Credits**	**Periods / Week**	**Credits**
Theory	01	02	01	01
Practical	03	04	03	02
Mini Project	--	--	--	02
Seminar	--	--	--	02
Comprehensive Viva - Voce	--	--	--	02
Final Year Project	--	--	--	10

i. As a norm, for the theory subjects, **one credit** for one contact period per week is assigned in semester system. In yearly pattern **two credits** for one contact period per week is assigned.

ii. As a norm, for practical courses **two credits** will be assigned for three contact periods per week in semester pattern. In yearly pattern **four credits** will be assigned for three contact periods per week.

iii. Tutorials do not carry any credits. However, each of the analytical and problem oriented courses will have one tutorial period per week.

iv. For Mini project/Project/Seminar/Comprehensive Viva-Voce, where formal contact hours are not specified, credits are assigned based on the complexity of the work to be carried out.

- The four year curriculum of any B.Tech, Program of study shall have a total of 224 credits.
- In the case of lateral entry students, B.Tech. program of study shall have a total of 172 credits.
- The exact requirements of credits for each subject will be as recommended by the concerned Board of Studies and approved by the Academic Council.

8. Examination System : All components in any Program of study will be Evaluated continuously through internal evaluation and an external evaluation component conducted as year/semester-end examination.

8.1 Distribution of Marks:

S.N 0	Examination	Marks%	Examination and Evaluation		Scheme of examination
1	Theory	70	Year/Semester-end examination (external Paper setting and evaluation)		This Examination question paper in theory subjects will be for a maximum of 70 marks. The question paper shall be of descriptive type with 8 questions (one question from each unit) out of which 5 are to be answered in 3 hours duration of the examination.
		30	20	Mid–Examination of 120 Min. duration (Internal evaluation). The question paper shall be of descriptive type with 5 questions out of which 4 are to be answered and evaluated for 20 marks.	**In Yearly Pattern:** Three (03) mid – term exams, each for 20 marks are to be conducted. Average of the best two mid-term exams shall be considered. **Mid-I:** After first spell of instructions (I to II Units). **Mid-II:** After second spell of instructions (III to V Units). **Mid-III:** After third spell of instructions (VI to VIII Units) **In Semester pattern:** Two (02) mid-term exams, each for 20 marks are to be conducted. Better of the two shall be considered. **Mid-I:** After first spell of instructions(I to IV Units) **Mid-II:** After second spell of instructions (V to VIII Units.)

			10	Assignment (Internal evaluation)	**In yearly pattern:** Three assignments shall be given and each will be evaluated for 10 Marks. Average of three Assignments shall be taken as internal marks for the assignments. **In Semester pattern:** Two assignments shall be given and each will be evaluated for 10 marks. Average of two Assignments shall be taken as internal marks for the assignments.
2	Laboratory	50	Year/ Semester-end Lab Examination (External evaluation)		50 marks are allotted for laboratory examination during year/semester-end.
		25	15	Continuous evaluation	Performance in laboratory experiments and Record.
			10	Internal evaluation	Practical Test at the end of the year / semester
3	Drawing	50	Year/ Semester-end drawing Examination (External evaluation)		50 marks are allotted for drawing examination during year/semester-end.
		50	30	Continuous evaluation	Performance in Drawing classes
			20	Internal evaluation	Practical tests (for yearly pattern three tests will be conducted. Average of best two will be taken. In semester pattern two tests will be conducted. Better of the two will be taken.
4	Seminar	50	Internal Evaluation		Evaluation during a semester by the Departmental Committee (DC).

5	Comprehensive Viva-Voce	100	Internal Evaluation		Viva-voce examination conducted at the end of IV year II Sem.
6	Mini Project	50	Internal evaluation		Evaluation by the DC
7	Project Work	200	150	External evaluation	Semester-end Project Viva-Voce Examination by a Committee as detailed under 8.2.
			50	Internal evaluation	Continuous evaluation by the DC

8.2 Project Work : Evaluation The Semester-End Examination (Viva-voce) shall be conducted by a Committee consisting of External examiner (nominated by the Chief Controller of Examinations), HOD, & Supervisor. The evaluation of project work shall be conducted at the end of the IV year second semester. The Internal Evaluation shall be made by the Departmental Committee, on the basis of two project reviews of each student.

8.3 Eligibility to appear for the year/ Semester-End examination:

8.3.1 A student shall be eligible to appear for year-end / Semester –End examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in a year / semester.

8.3.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in first year or each semester may be granted on medical grounds by the College Academic Committee. A stipulated fee shall be payable towards condonation of shortage of attendance to the College.

8.3.3 Shortage of Attendance below 65% in aggregate shall in no case be condoned and the candidate will be detained.

8.3.4 Detained students are not eligible to take their end examination of that class and their registration shall stand cancelled.

8.3.5 A student detained due to shortage of attendance, will have to repeat that year / semester when offered next.

8.4 Evaluation: Following procedure governs the evaluation.

8.4.1 The marks for the internal evaluation components will be added to the external evaluation marks secured in the Year/Semester –End examinations, to arrive at total marks for any subject in that Year/semester.

8.4.2 Performance in all the subjects is tabulated program-wise and will be scrutinized by the Examination Committee and moderation is applied if needed, and subject-wise marks lists are finalized. Total marks obtained in each subject are converted into letter grades.

8.4.3 Student-wise tabulation is done and student-wise Grade Sheet is generated and issued to the students.

8.5 Revaluation / Recounting:

Students shall be permitted for request for recounting/revaluation of the year / Semester-End examination answer scripts within a stipulated period after payment of prescribed fee. After recounting or revaluation, records are updated with changes if any and the student will be issued a revised grade sheet. If there are no changes, the same will be intimated to the students.

8.6 Supplementary Examination:

8.6.1 In addition to the regular year/ Semester- End examinations conducted, the College may also schedule and conduct supplementary examinations for all the subjects of other year/ semesters when feasible for the benefit of students. Such of the candidates writing supplementary examinations may have to write more than one examination per day.

8.6.2 If any candidate fails to secure pass marks in the Seminar / Comprehensive Viva-Voce / Mini Project, he can be permitted to register for supplementary examinations.

9. Academic Requirements for Promotion/ completion of regular B.Tech Program of study:

The following academic requirements have to be satisfied in addition to the attendance requirements for promotion/completion of regular B.Tech Program of study.

9.1 For students admitted in B.Tech (Regular) Program:

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design drawing subject or project if he secures not less than 35% of marks in the year / Semester End examination and a minimum of 40% of marks in the sum total of the internal evaluation and year / Semester-End examination taken together. For the seminar, mini project and comprehensive viva he should secure 40% of marks in the internal evaluation.

ii. A student shall be promoted from second year to third year only if he fulfills the academic requirement of securing 54 credits from**:**

a) Two Regular and One Supplementary examinations of I year.
b) One Regular and One Supplementary examination of Second year I semester.
c) One Regular Examination of Second year II semester.

Irrespective of whether the candidates appear for Semester-End examination or not as per the normal course of study.

iii. A student shall be promoted from third year to fourth year Program of study only if he fulfills the academic requirements of securing 82 credits from**:**

a) Three regular and two supplementary examinations of first year
b) Two regular and two supplementary examination of second year first semester.
c) Two regular and one supplementary examinations second year second semester.
d) One regular and one supplementary examination of third year first semester.
e) One Regular Examination of Third year II semester.

Irrespective of whether the candidate appears for the Semester-End examination or not as per the normal course of study and in case of getting detained for want of credits by sections 9.1(ii) and 9.1 (iii) above, the student may make up the credits through supplementary examinations before the date of commencement of class work for III year I semester or IV year I semester as the case may be.

iv. A student shall register for all the 224 credits and *earn* all the 224 credits. Marks obtained in all the 224 credits shall be considered for the award of the class based on CGPA.

v. A student who fails to earn 224 credits as indicated in the course structure within **eight** academic years from the year of their admission shall forfeit his seat in B. Tech. Program and his admission stands cancelled.

9.2 For Lateral Entry Students (batches admitted from 2013-2014):

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project if he secures not less than 35% of marks in the Semester-End examination and a minimum of 40% of marks in the sum total of the internal evaluation and Semester-End examination taken together. For the seminar,mini project and Comprehensive viva the student should secure 40% of marks in the internal evaluation.

ii. A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of securing 56 credits from the following examinations.

a) Two regular and two supplementary examinations of II year I semester.
b) Two regular and one supplementary examination of II year II semester.
c) One regular and one supplementary examination of III year I semester.
d) One Regular Examination of Third year II semester.

Irrespective of whether the candidate appear the Semester-End examination or not as per the normal Course of study and in case of getting detained for want of credits the student may make up the credits through supplementary exams of the above exams before the date of commencement of class work for IV year I semester.

iii. A student shall register for all 172 credits and earn all the 172 credits. Marks obtained in all 172 credits shall be considered for the award of the class based on CGPA

iv. A student who fails to earn 172 credits as indicated in the Course structure within **six** academic years from the year of their admission shall forfeit his seat in B.Tech. Program and his admission stands cancelled.

10. Transitory Regulations:

Students who got detained for want of attendance (**or)** who have not fulfilled academic requirements (**or**) who have failed after having undergone the course in earlier regulations (**or**) have discontinued 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 subjects are offered and they continue to be in the academic regulations of the batch they join later.

A regular student has to satisfy all the eligibility requirements within the maximum stipulated period of **eight years,** and a lateral entry student within **six years,** for the award of B.Tech Degree.

11. Grades, Grade Point Average and Cumulative Grade Point Average

11.1 Grade System : After all the components and sub-components of any subject (including laboratory subjects) are evaluated, the final total marks obtained will be converted to letter grades on a "**10 point scale**" described below.

% of marks obtained	Grade	Grade Points(GP)
90 to 100	A+	10
80 to 89	A	9
70 to 79	B	8
60 to 69	C	7
50 to 59	D	6
40 to 49	E	5
Less than 40 in sum of Internal & External (or) Less than 25 in External	F	0
Not Appeared	N	0

- **Pass Marks:** A student is declared to have passed theory and/ or laboratory subject, if he secures minimum of 35% marks in external examination, and a minimum of 40% marks in the sum total of internal evaluation and external examination taken together. Otherwise he will be awarded fail grade – **F** in such subject irrespective of internal marks.
- **F** is considered as a fail grade indicating that the student has to pass the year / semester-end examination in that subject in future and obtain a grade other than **F** and **N** for clearing this subject.

11.2 Grade Point Average (GPA):

Grade Point Average (GPA) will be calculated as given below on a "10 Point scale" as an Index of the student's performance at the end of I year / each semester:

$$\textbf{GPA} = \frac{\sum(\boldsymbol{CXGP})}{\sum \boldsymbol{C}}$$

Where C denotes the credits assigned to the subjects undertaken in that Year/ semester and **GP** denotes the grade points earned by the student in the respective subjects.

11.3 Cumulative Grade Point Average (CGPA):

At the end of every year / semester, a Cumulative Grade Point Average (CGPA) on a 10 Point scale is computed considering all the subjects passed up to that point as an index of overall Performance up to that Point as given below:

$$\textbf{CGPA} = \frac{\sum(\boldsymbol{CXGP})}{\sum \boldsymbol{C}}$$

Where C denotes the credits assigned to subjects undertaken upto the end of the current year/semester and GP denotes the grade points earned by the student in the respective courses.

11.4 Grade Sheet: A grade sheet (Marks Memorandum) will be issued to each student Indicating his performance in all subjects registered in that year/ semester Indicating the GPA and CGPA. GPA and CGPA will be rounded off to the second place of decimal.

12. Transcripts: After successful completion of the entire Program of study, a transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued, if required, after payment of requisite fee.

13. Award of Degree : The Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Anantapur on the recommendation of The Principal of SVCET (Autonomous).

13.1 Eligibility : A student shall be eligible for the award of B.Tech. Degree if he fulfills all the following conditions:

- Registered and successfully completed all the components prescribed in the program of study for which he is admitted.
- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of study within the stipulated time.
- Obtained CGPA greater than or equal to 5.0 (Minimum requirement for declaring as passed.)

13.2 Award of Class : Declaration of Class is based on CGPA.

Cumulative Grade Point Average	Class
≥7.0	First Class with Distinction
≥6.0 and<7.0	First Class
>5.0 and <6.0	Second Class
5.0	Pass Class

14. 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 into the next higher semester. The issue of degree is liable to be withheld in such cases.

15. Additional academic regulations:

i. A regular student has to complete all the eligibility requirements within the maximum stipulated period of **eight** years, and a lateral entry student within **six** years.

ii. A student can appear for any number of supplementary examinations till he clears all subjects within the stipulated period.

iii. A grade sheet (marks memorandum) will be issued to the student

indicating his performance in all the courses of that year /semester along with the GPA and CGPA.

iv. A transcript containing the performance in all the components required for eligibility for award of the Degree will be issued to the student.

v. Any canvassing / impressing the administration, examiners, faculty or staff in any form, the candidate is liable for punishment as per the mal practice rules appended here with.

vi. When a student is absent for any examination (internal or external) he is treated as to have appeared and obtained z**ero** marks in that component (course) and grading is done accordingly.

vii. When a component is cancelled as a penalty, he is awarded zero marks in that component.

16. Amendments to regulations:

The Academic Council Sri Venkateswara College of Engineering and Technology (Autonomous) reserves the right to revise, amend, or change the Regulations, Scheme of Examinations, and / or Syllabi or any other Policy relevant to the needs of the society or industrial requirements etc.., without prior notice.

17. General:

Where the words "he","him","his","himself" occur in the regulations, they include "she", "her", "herself".

Note: Failure to read and understand the regulations is not an excuse.

SRI VENKATESWARA COLLEGE OF ENGINNERING & TECHNOLOGY

(AUTONOMOUS)

(AFFILIATED TO JNTUA, ANANTAPUR)

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.	Has copied 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 is to be cancelled.

3.	Comes in a 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 to appear for the remaining examinations of the subjects of that Semester/year.
4.	Smuggles in the Answer book or 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 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 for two consecutive semesters from class work and all University 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 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 for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.

6.	Possess 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 is also debarred and forfeits of seat.
7.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits 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 is also debarred for two consecutive semesters from class work and all University 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 is registered against him.

8.	Refuses to obey the orders of the Chief Superintendent / Assistant – 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 of any injury to his person or to any of his relations 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 or 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.	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 debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
9.	If 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 clause 6 to 8.	Student of the colleges 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.	Copying detected 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.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Examination committee for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators

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

Identification of Courses

B. Tech

Each course shall be uniquely identified by an alphanumeric code of width 7 characters as given below.

No. of digits	Description
First two digits	Year of regulations Ex:12
Next one letter	Type of program: A: B. Tech B: M. Tech C: M.B.A D: M.C.A
Next two letters	Code of department: HS/CE/CS/EE/EC/IT/ME/MB/MC
Last two digits	Indicate serial numbers: ≥ 01

Ex: I Year Course:

12AHS01
12AHS02
12AHS03
12AHS04
12ACS01
12AEE01
12AEC01
12ACE01
12AME01
12AHS05
12ACS02
12AME02
12AHS06

SRI VENAKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Structure(2012-13)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

I B.Tech(Yearly Pattern)

S. No	Course Code	Course Name	Hours/Week			Credits	Scheme of Examination (M Marks)		
			L	T	P	C	Internal	External	Total
1	12AHS01	Technical English	2	-	-	4	30	70	100
2	12AHS02	Engineering Mathematics-I	3	1	-	6	30	70	100
3	12AHS03	Engineering Physics	2	-	-	4	30	70	100
4	12AHS04	Engineering Chemistry	2	-	-	4	30	70	100
5	12ACS01	Programming in C & Data Structures	3	1	-	6	30	70	100
6	12AEE02	Basic Electrical & Electronics Engineering	3	1	-	6	30	70	100
7	12AME01	Engineering Drawing	2	-	4	6	50	50	100
8	12AHS05	Engineering Physics & Engineering Chemistry Lab	-	-	3	4	25	50	75
9	12ACS02	Computer Programming Lab	-	-	3	4	25	50	75
10	12AME02	Engineering and IT Workshop	-	-	3	4	25	50	75
11	12AHS06	English Language communication skills Lab	-	-	3	4	25	50	75
Total			17	3	16	52	330	670	1000

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Structure (2012-2013)

Computer Science & Engineering

II B.Tech – I Semester

S.No	Course Code	Course Name	Hours/Week			Credits	Scheme of Examination (M Marks)		
			L	T	P	C	Internal	External	Total
1	12AHS07	Engineering Mathematics-II	4	1	-	4	30	70	100
2	12AHS09	Environmental Science	4	1	-	4	30	70	100
3	12ACS03	Advanced Data Structures	4	1	-	4	30	70	100
4	12AEC08	Digital Logic Design	4	1	-	4	30	70	100
5	12ACS04	UNIX Shell Programming	4	1	-	4	30	70	100
6	12AHS08	Probability &Statistics	4	1	-	4	30	70	100
7	12ACS05	Data Structures Lab	-	-	3	2	25	50	75
8	12ACS06	UNIX Shell Programming Lab	-	-	3	2	25	50	75
Total			24	6	6	28	230	520	750

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY									
(AUTONOMOUS)									
Course Structure (2012-2013)									
Computer Science & Engineering									
II B.Tech – II Semester									
S.No	**Course Code**	**Course Name**	**Hours/Week**			**Credits**	**Scheme of Examination (M Marks)**		
			L	**T**	**P**	**C**	**Internal**	**External**	**Total**
1	12ACS07	Computer Organization	4	1	-	4	30	70	100
2	12ACS08	Discrete Mathematics for Computer Science	4	1	-	4	30	70	100
3	12AEC16	Microprocessors & Interfacing	4	1	-	4	30	70	100
4	12ACS09	Java Programming	4	1	-	4	30	70	100
5	12AHS11	Managerial Economics & Financial Analysis	4	1	-	4	30	70	100
6	12ACS10	Theory of Computation	4	1	-	4	30	70	100
7	12ACS11	Java Programming Lab	-	-	3	2	25	50	75
8	12AEC17	Microprocessors & Interfacing Lab	-	-	3	2	25	50	75
Total			24	6	6	28	230	520	750

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY									
(AUTONOMOUS)									
Course Structure (2012-2013)									
Computer Science & Engineering									
III B.Tech – I Semester									
S.No	**Course Code**	**Course Name**	**Hours/Week**			**Credits**	**Scheme of Examination (M Marks)**		
			L	**T**	**P**	**C**	**Internal**	**External**	**Total**
1	12ACS12	Software Engineering	4	1	-	4	30	70	100
2	12AHS12	Management Science	4	1	-	4	30	70	100
3	12ACS13	Compiler Design	4	1	-	4	30	70	100
4	12ACS14	Computer Graphics	4	1	-	4	30	70	100
5	12ACS15	Computer Networks	4	1	-	4	30	70	100
6	12ACS16	Operating Systems	4	1	-	4	30	70	100
7	12ACS17	Compiler Design & Computer Graphics Lab	-	-	3	2	25	50	75
8	12ACS18	Computer Networks & Operating Systems Lab	-	-	3	2	25	50	75
Total			24	6	6	28	230	520	750

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY									
(AUTONOMOUS)									
Course Structure (2012-2013)									
Computer Science & Engineering									
III B.Tech – II Semester									
S.No	**Course Code**	**Course Name**	**Hours/Week**			**Credits**	**Scheme of Examination (M Marks)**		
			L	**T**	**P**	**C**	**Internal**	**External**	**Total**
1	12ACS19	Object Oriented Analysis & Design	4	1	-	4	30	70	100
2	12ACS20	Principles of Programming Languages	4	1	-	4	30	70	100
3	12ACS21	Design & Analysis of Algorithms	4	1	-	4	30	70	100
4	12ACS22	Information Security	4	1	-	4	30	70	100
5	12ACS23	Internet & Web Technology	4	1	-	4	30	70	100
6	12ACS24	Database Management Systems	4	1	-	4	30	70	100
7	12ACS25	Web Technologies Lab	-	-	3	2	25	50	75
8	12ACS26	Database Management Systems Lab	-	-	3	2	25	50	75
9	12ACS27	Seminar	-	-	-	2	50	-	50
Total			24	6	6	30	280	520	800

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Structure (2012-2013)

Computer Science & Engineering

IV B.Tech – I Semester

S.No	Course Code	Course Name	Hours/Week			Credits	Scheme of Examination (M Marks)		
			L	T	P	C	Internal	External	Total
1	12ACS28	E-Commerce	4	1	-	4	30	70	100
2	12ACS29	Software Testing	4	1	-	4	30	70	100
3	12ACS30	Data Mining & Business Analytics	4	1	-	4	30	70	100
4	12ACS31	Distributed Systems	4	1	-	4	30	70	100
Elective - I									
5	12ACS32	Artificial Intelligence & Expert Systems	4	1	-	4	30	70	100
	12ACS33	Neural Networks & Fuzzy logic							
	12ACS34	Pattern Recognition & Image Processing							
Elective - II									
6	12ACS35	Grid and Cluster Computing	4	1	-	4	30	70	100
	12ACS36	Advanced Computer Architecture							
	12ACS37	Network Management Systems							
7	12ACS41	Software Testing &Case Tools Lab	-	-	3	2	25	50	75
8	12ACS42	Data Mining Lab	-	-	3	2	25	50	75
9	12ACS43	Mini Project	-	-	-	2	50	-	50
Total			24	6	6	30	280	520	800

SRI VENAKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY									
(AUTONOMOUS)									
Course Structure (2012-2013)									
Computer Science & Engineering									
IV B.Tech – II Semester									
S.No	**Course Code**	**Course Name**	**Hours/Week**			**Credits**	**Scheme of Examination (M Marks)**		
			L	**T**	**P**	**C**	**Internal**	**External**	**Total**
1	12ACS44	Software Patterns	4	1	-	4	30	70	100
Elective - III									
2	12ACS38	Software Project Management	4	1	-	4	30	70	100
	12ACS45	Software Architecture							
	12ACS46	Information Retrieval Systems							
Elective - IV									
3	12ACS40	Wireless Adhoc Networks	4	1	-	4	30	70	100
	12ACS47	Storage Area Networks							
	12ACS48	Multimedia & Application Development							
Elective - V									
4	12ACS39	Computer Simulation & Modeling	4	1	-	4	30	70	100
	12AEC45	Cellular & Mobile Communications							
	12AIT10	Principles of Nano Technology							
5	12ACS49	Comprehensive Viva Voce	-	-	-	2	100	-	100
6	12ACS50	Project Work	-	-	-	10	50	150	200
Total			16	4	-	28	270	430	700

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

B.Tech CSE I Year	**L**	**T**	**P**	**C**
	2	**0**	**0**	**4**

12AHS01 TECHNICAL ENGLISH

(Common to all Branches)

Objectives:

1. *To train the students to think logically and reasonably*
2. *To train students to use language effectively and to expose the students to a varied blend of self-instructional, learner-friendly modes of language learning.*
3. *To improve the students' proficiency in English at all levels.*
4. *To enhance the confidence of the students by exposing them to various situations and context which they face in their career.*

Outcomes:

After completion of the course the student will be able to

1. *master in four basic skills (LSRW) to channelize their notions in simple and grammatical English.*
2. *use English for communication and for performing the technical functions*
3. *use English as a vehicle to touch the technical sky*
4. *use logical and reasonable ability while attending written examination and interviews*

UNIT-I

Text: **IN LONDON** - by M.K. Gandhi

Non- Detailed: Wings of Fire by Abdul Kalam – lessons 1 to 3

UNIT-II

Text: **MAN'S PERIL** by - Bertrand Russell

Non- Detailed: Wings of Fire- lessons 4 to 6

UNIT-III

Text: **THE GOLD FRAME** by- R.K. Laxman

Non- Detailed: Wings of Fire- lessons 7 to 9

UNIT-IV

Text: **A SERVICE OF LOVE** by - O. Henry

Non- Detailed: Wings of Fire- lessons 10 to 12

UNIT-V

Text: **ENVIRONMENT** by – C.V. Raman

Non – Detailed: Wings of Fire –lessons 13 to 15

UNIT- VI

Text: **C.V. RAMAN** by – Subhashree Desikan.

Non – Detailed: Wings of Fire –lessons 16 to 18

UNIT- VII

Text: **THE MAN WHO WOULD BE KING**- Rudyard kipling

Non-Detailed: wings of fire- lessons 19 to 21

UNIT- VIII

Text: **LIVING OR DEAD**- Rabindranath Tagore

Non-Detailed: Wings of Fire –lessons 22 to 24

REMEDIAL GRAMMAR:

1. Correction of sentences
2. Sub-verb agreement
3. Use of articles and prepositions, active/passive voice and reported speech
4. Vocabulary development
    a) Synonyms and antonyms
    b) Prefixes and suffixes
    c) One word substitutions
    d) Idioms and phrases
    e) Words often confused
    f) Homophones, Homo graphs and Homonyms

Text Books:

1. Text: Technical English
2. Non Detailed: Wings of Fire- Abdul Kalam. APJ. Universities Press, 2004

References:

1. *Ashraf Rizvi M. Resumes and interviews,Tata- McGraw Hill, 2009*
2. *Robert J. Dixson, Everyday Dialogues in English by Prentice-Hall of India Ltd., 2006.*
3. *Andrea J Rutherford -Basic communication skills for Technology, Pearson Education, Asia Ltd, 2000.*
4. *Thomson Martinet- Practical English Grammar by, Oxford, 1986.*
5. *Leech Svartvik, Communicative Grammmar of English. Longman, 1975.*
6. *Swan Practical English Usage, oxford, 2005.*
7. *Johnson, Communication in the class room, Longman, 1999.*
8. *Horn A.S. Oxford Advanced Learners Dictionary.Oxford, 1948.*
9. *Bansal R.K, Harrison J B, Spoken English, Longman, 1983*
10. *Balasubramaniyam T. A Text Book of English Phonetics for Indian students, Macmillan, 2000.*
11. *MeenakshiRaman Sangeetha Sharma Technical communication, Oxford, 2004.*
12. *Krishna Mohan Developing Communication Skills, Macmillan, 2000.*
13. *Daniel Jones An Out Line of English Phonetics, Kalyani Publishers, 1940.*
14. *Ahuja BN Dictionary of Synonyms & Antonyms, Good will Publishers, 2008.*
15. *Cambridge International of Phrasal Verbs, Cambridge, 1997.*
16. *Martin Hewings Essential English Grammar , Cambridge, 2000*
17. *John Eastwood Oxford Practice Grammar, Oxford, 2004.*
18. *Daniel Jones English Pronouncing Dictionary Oxford, 2002*

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(AUTONOMOUS)

B.Tech CSE- I Year

L	T	P	C
3	1	0	6

12AHS02 ENGINEERING MATHEMATICS –I

(Common to all branches)

Objectives:

1. *To model and analyze real life problems.*
2. *Apply Differential equations, Laplace transforms, Integrals and multiple integrals to Engineering problems.*
3. *To increase the student's appreciation of the basic role played by mathematics in modern technology*

Outcomes:

After completion of the course, the student will be able to

1. *Familiar with the applications of differential equations, Laplace transforms, Vector Integrals and Multiple integrals, Curve tracing and vector calculus.*
2. *appreciate the usage of above concepts to engineering applications.*

UNIT-I

DIFFERENTIAL EQUATION: Differential equation of first order and first degree-exact, Non – exact, linear and Bernoulis Equations-Applications of first order and degree of Differential equation: Orthogonal Trajectories, Newton's Law of cooling, Law of Natural Growth and decay.

UNIT-II

NON-HOMOGENOUS AND LINEAR DIFFERENTIAL EQUATION :Non-homogenous and Linear Differential equation of 2^{nd} order and higher order with Constant co-efficient with R.H.S terms of the type e^{ax} ,sinax, cosax, polynomials in x, $e^{x}v(x)$, xV(x),Method of variation of parameters.-Variable Coefficients-L-R-C Circuits.

UNIT-III

MEAN VALUE THEOREMS: Rolle's theorem-Lagrange's mean value theorem (without proof)-Taylor's theorem and Maclaurin's series-functions of several variables –Jacobian-maxima and Minima for functions of two variables-Lagrangean method of multipliers of 3 variables only.

UNIT-IV

RADIUS OF CURVATURE: Curve tracing-Cartesian, polar, parametric curves. Applications of Integration: length, Volume and surface area of solid of revolution Cartesian and polar co-ordinates.

UNIT-V

MULTIPLE INTEGRALS: Double and Triple integrals-Change of variables-change of Order of integration.

UNIT-VI

LAPLACE TRANSFORMS-I: Laplace transforms of standard functions-Inverse Transforms-First –Shifting Theorem-transforms of derivatives and integrals-Unit step Function-2nd Shifting Theorem –Dirac delta Functions-.

UNIT-VII

LAPLACE TRANSFORMS-II: convolution theorems- Laplace transforms of periodic functions. Differentiation and integration Laplace transforms. Applications of Laplace transform ordinary differential equation of 1st and 2nd order

UNIT-VIII

VECTOR CALCULUS : Gradient, Divergence, curl and their properties. Vector Integration: line Integrals –potential functions-area, surface and volume integrals -Vector Integral theorems**:** Green's theorem-Stoke's theorem& Gauss Divergence theorems (without proof)-Verification of Green's, Stoke's and Gauss's Theorem

Text Books:

1. Iyengar. T.K.V., Krishna Gandhi .B and others, *A Text book of Engineering Mathematics – I,*New Delhi, S.Chand and company,2011.
2. Shankaraiah.C, *A Text book of Engineering Mathematics*, Vijayawada,VGS book links,2007.
3. Rukmangadachari.E and Keshava Reddy, *A Text book of Engineering Mathematics-I,* Pearson Education

References:

1. Dr..Grewal .B.S, *Higher Engineering Mathematics*,New Delhi,Khanna Publishers,2004.
2. Ramana .B.V., *A Text book of Engineering Mathematics*, Tata Mc Graw Hill,2009.
3. Thomson ,*A Text book of Engineering Mathematics*, Book Collection
4. Bail.N, Goyal.M. & Walking.C, A Text book of Advanced Engineering Mathematics-A computer approach

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B. Tech CSE I Year	**L**	**T**	**P**	**C**
	2	**-**	**-**	**4**

12AHS03 **ENGINEERING PHYSICS**
(Common to all Branches)

OBJECTIVES:

1. *To understand the basic concepts of light, crystallography and X-ray diffraction, Quantum mechanics, Lasers and Fiber optics applicable to basic engineering concepts.*
2. *To understand the importance of semiconductors, superconductors, nano materials, dielectric & magnetic materials in the various engineering fields*

OUTCOMES:

After completion of the course students will be able to

1. *imbibe the knowledge of wave nature of light, crystallography, behavior of electrons in various potential fields, band theory solids, semiconductors & super conductors, magnetic &dielectric materials applicable to material science*
2. *get Knowledge about the advanced concepts of engineering physics.*

Unit I

OPTICS: Interference in thin films by reflection – Interference by air wedge method – Newton Rings. Diffraction – Fraunhofer diffraction at single slit – Diffraction grating – Grating spectrum. Polarization – Nicol prism – Theory of circular and elliptical polarized light – Quarter and Half wave plates – Applications.

UNIT II

CRYSTAL STRUCTURES: Introduction – Space lattice – Basis – Unit cell – Lattice parameter – Crystal systems – Bravais lattices – Structure and packing fractions of Simple cubic, body centered cubic, face centered cubic crystals – structures of Diamond, ZnS, NaCl.

CRYSTAL PLANES AND X-RAY DIFFRACTION: Directions and planes in crystals – Miller Indices – Separation between successive [h k l] planes – Diffraction of X-rays by crystal planes – Bragg's law –Laue method and powder method.

UNIT III

PRINCIPLES OF QUANTUM MECHANICS: Wave and particles – Planck's quantum theory – de Broglie hypotheses – Matter waves – Davisson and Germer experiment – Schrödinger time independent wave equation – Physical significance of wave function – Particle in one dimensional box – Quantum free electron theory – Fermi-Dirac distribution & effect of temperature – Electron scattering and resistance - Temperature and compositional dependence with examples – Bloch theorem (statement only) – Kroning Penney model(qualitative treatment only) – Origin of energy band formation in solids – Metals, semiconductors and insulators.

UNIT IV

SEMICONDUCTORS: Introduction – Intrinsic semiconductor and carrier concentration –Extrinsic semiconductor and carrier concentration –Fermi level-Equation of conductivity - Drift and diffusion – Einstein's equation – Hall Effect.

SUPERCONDUCTORS: General properties of superconductors – Meissner effect – Penetration depth – Type I and Type II superconductors – Flux quantization – Josephson effect – BCS theory – Application of superconductors - SQUID Electronics.

UNIT V

NANOMATERIALS: Introduction – Basic properties of nanomaterials – Fabrication of nanomaterials: Ball milling, Spray pyrolysis, Plasma arching, Chemical vapor deposition, Sol-Gel method –Carbon Nano Tubes -Application of nanomaterials and carbon nano tubes .

UNIT VI

DIELECTRIC PROPERTIES: Introduction – Dielectric constant – Electronic, Ionic and Oriental polarizations – Internal fields – Clausius-Mossotti equation - Frequency dependence of the polarizability – Ferro and Piezo electricity**.**

MAGNETIC PROPERTIES: Introduction – Origin of magnetic moment – Classification of magnetic materials – Dia, Para, Ferro, antiferro and ferri magnetism– Hysteresis curve – Soft and Hard magnetic materials and their applications.

UNIT VII

LASERS: Introduction – Characteristics of lasers – Spontaneous and stimulated emission of radiation – Einstein's coefficients – population inversion –Ruby laser - He-Ne laser – Semiconductor laser – Applications of laser.

UNIT VIII

FIBER OPTICS : Introduction – Principle of optical fiber – Acceptance angle and acceptance cone – Numerical aperture – Step-Index fiber and transmission of signal in SI fiber – Graded-Index fiber and transmission of signal in GI fiber – Attenuation in optical fibers –Optical fibers in communication system - Advantages of optical fibers in communication – Optical fiber communication system. Application of optical fibers in medicine and sensors.

Text Books:

1. Dr. Mani Naidu.S: *Engineering Physics*, 1st Edition, Pearson Publishing House, 2012.
2. Rajendran and Thyagarajan: *Engineering Physics*, Delhi, TMH Publishers, 2011
3. Palanisamy .p. k: *Engineering Physics*, Hyderabad, Scitech Publications, 2009
4. Gaur and Gupta: *Engineering Physics*, New Delhi, Dhanpat Rai Publishers, 2003

Reference Books:

1. Pillai.S.O: *Solid State Physics*, 6th edition,New Delhi: New Age International, 2005.
2. Kittel.C: *Introduction to Solid State Physics*,7th edition, New Delhi: Wiley publishers, 2008.
3. Chattopadhyay,k.k, Banerje,A.N*: Introduction to Nano Science and Technology*,New Delhi: PHI,2009 .
4. Resnick, Halliday and Walker: *Fundamentals of Physics*, 6th Edition, New Delhi: Wiley Publishers, 2001.
5. Pradeep, T: *Nano, The essentials*, TMH, 2008.

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	2	**-**	**-**	**4**

12AHS04 **ENGINEERING CHEMISTRY**

(Common to all Branches)

Objectives:

1. *To understand importance of Hard water treatments, corrosion factors, polymer properties, fuels-calorific values, lubricants, explosives and propellants.*
2. *Basic concept of Batteries function, nano materials, composite materials, principles of absorption and emission of radiations.*

Outcomes:

After Completion of the course student will be able to

1. *Understand the disadvantages of hard water, designing of corrosion resistance metallic part, selection of suitable polymers and fuels, handling of explosives and propellants.*
2. *Understand the difference between batteries and fuel cells, application of nano materials and composite materials, estimation of metal ion concentration*.

UNIT- I

WATER TECHNOLOGY: Sources of Water - Types of impurities in Water - Hardness of Water – Temporary and Permanent hardness-Units of hardness - Disadvantages of Hard Water - Estimation of hardness by EDTA titration methods - Numerical Problems on calculation of hardness of water; Dissolved Oxygen . Methods of Treatment of Water for Domestic purposes – Treatment of Water for Industrial purpose – Characteristics of Water for Steam generation, Boiler Troubles – Boiler Corrosion - Carry Over (Priming and Foaming), Scales and Sludges, Caustic Embrittlement. Internal conditioning methods – Colloidal, Phosphate, Calgon, Carbonate, Sodium aluminates Conditioning of Water.

Water softening methods: Zeolite process – Ion- Exchange Process - Demineralization of Brackish Water – Electro dialysis and Reverse Osmosis.

UNIT – II

CORROSION ENGINEERING: Definition, Types (dry and wet corrosion) and causes of corrosion – Theories and mechanism of corrosion - Galvanic Series, Galvanic Corrosion, Concentration Cell Corrosion, Oxygen absorption type of corrosion - Factors influencing corrosion. Control of Corrosion – Cathodic Protection – Sacrificial anodic and Impressed Current cathodic protection – Corrosion Inhibitors - Electro Plating and Electro less plating (Principles and applications with copper and nickel plating as examples).

UNIT – III

HIGH POLYMERS: Classification of polymers – Mechanism of polymerization – addition and condensation. Plastics –Thermosetting and Thermoplastics. Preparation, Properties and Engineering applications of PE, PTFE, PVC, Nylon, Bakelite ; Rubber - Processing of Natural Rubber- Vulcanization - Compounding of rubber – Synthetic rubber - Buna S, Buna N, Polyurethane Rubber, Silicone Rubber. Moulding of plastics into articles - Compression, Injection, transfer and extrusion methods. Conducting Polymers- Classification - Properties and applications of conductive polymers –Methods of degradation of polymers - Biodegradable polymers.

UNIT- IV

FUELS AND COMBUSTION: Fuels – Definition and Classification of fuels - Calorific value - LCV, HCV, measurement of calorific value using Bomb calorimeter and Junkers gas calorimeter (numerical problems) – characteristics of a good fuel. Solid fuels: Metallurgical Coke – Characteristics & Manufacture (Otto-Half Mann method) Liquid Fuels: Source of petroleum – fractionation -Gaseous fuels: LPG, natural gas, CNG - composition and applications. Biofuels: Biodiesel and Biogas – Composition and applications. Combustion: Definition and Calculation of air quantities (numerical problems), Flue gases and their analysis by Orsat's apparatus.

UNIT- V

LUBRICANTS, EXPLOSIVES AND PROPELLANTS: Lubricants: Function of lubricant – Classification - liquid, semi solid and solid - mechanism of different types of lubrication - properties: Viscosity, Flash and fire points, Aniline point, and Mechanical strength – Selection of lubricants. Explosives and Propellants: Classification of explosives – Blasting fuses – Important explosives – Uses of explosives. Monopropellants and bipropellants – Classification of Rocket propellants - Examples, composition and applications.

UNIT- VI

ELECTROCHEMICAL ENERGY SYSTEMS: Electrochemical Cells**:** Measurement of EMF, Standard electrode potential, concentration cells; Basic concepts, working principles, characteristics and applications of different electrochemical energy systems - Conventional Primary battery - Dry cell; Advanced Primary batteries - Lithium and alkaline; Conventional secondary batteries: Lead-acid, Nickel-Cadmium; Advanced secondary batteries: Nickel-Metal hydride and Lithium-ion. Fuel cells: Hydrogen-oxygen and methanol–oxygen construction, working and applications.

UNIT- VII

MATERIALS CHEMISTRY: Composite materials: Constituents of composites – Types of composites- Fibre reinforced, metal matrix, ceramic – properties and specific applications. Nanomaterials: classification, properties and applications

General methods of preparation of nanomaterials – combustion and sol-gel processes of preparation of Silver, Zinc oxide and Ruby nanoparticles

UNIT- VIII

INSTRUMENTAL METHODS OF ANALYSIS: Electromagnetic spectrum: EMR interaction with matter - absorption and emission of radiation. Colorimetry and Spectrophotometry - UV- visible – Principle – Beer-Lambert's law- Instrumentation of colorimeter, single beam and double beam spectrophotometer – Quantitative applications of colorimetric analysis – estimation of concentration of a typical metal ion (Iron – 1,10 - phenonthroline complex).

TEXT BOOKS:

1. Jain & Jain. *Text book of Engineering Chemistry*. 15th edition. New Delhi: Dhanpat Rai Publishing Company, 2008.
2. *A text book of Engineering Chemistry by* S.S. Dara, S.Chand & Co, New Delhi (2008)
3. Prof. Jayaveera,K.N , Dr. Subba Reddy,G.V and Dr.Ramachandraiah,C. *Engineering Chemistry*.Hyd: McGraw Hill Higher Education , 2009
4. Mamata V. Sachdeva. *Basics of Nanochemistry*. New Delhi: Anmol Publications Pvt. Ltd,2011
5. Gurudeep and chatwaal. *Instrumental methods of analysis. Mumbai:* Himalaya Publishing House,1979

REFERENCE BOOKS:

1. Dr.Chandrasekhar.K.B, Dr.Dash.U.N and Dr.Sujatha Mishra. *Engineering Chemistry*. Hyderabad: Scitech Publications Pvt. Limted, 2009
2. *Fuel Cells principle and applications* by B.Viswanath, M.Aulice Scibioh-Universities press
3. Agarwal.C.V.*Chemistry of Engineering Materials*. Varanasi:Tara Publication, 2008
4. *Physical Chemistry*-Glasston & Lewis.
5. Kuriacose.J.C and Rajaram.J *Engineering Chemistry (Vol.1&2)*. New Delhi: Tata McGraw-Hill , 2004
6. *Applied chemistry*: A Text Book for Chemistry for Engineers & Technologists, G.D.Gesser, Springer,2000
7. Muralidharan.V.S and A.Subramania. *Nano Science and technology*.New Delhi:Aue Books Pvt. Ltd 2009

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B.Tech.CSE I year	**L**	**T**	**P**	**C**
	3	**1**	**-**	**6**

12ACS01 **Programming in C & Data Structures**

(Common to all Branches)

Objectives:

1. *Learn how these principles are implemented in the C programming language.*
2. *Develop problem-solving skills to translate 'English' described problems into programs written using the C language.*
3. *An understanding of the function and operation of development software such as the compiler, interpreter, editor, IDE (Integrated Development Environment), and debugger.*

Outcomes:

At the end of the subject, students will be able to:

1. *Solve engineering problems using the C language*
2. *Students are expected to improve their programming skills.*
3. *Students are expected to apply the knowledge gained for their project work*.

UNIT – I

Introduction – The Problem Solving aspect – Top Down Design – Implementation of Algorithms – Program Verification – Efficiency of Algorithms – Analysis of Algorithms

UNIT - II

Introduction to C Language – Background, Simple C Program, Identifiers, Basic data types, Variables, Constants, Input / Output, Operators. Expressions, Precedence and Associativity, Expression Evaluation, Type conversions, Bitwise operators, Statements, Simple C Programming examples. Selection Statements – if and switch statements, Repetition statements – while, for, do-while statements, Loop examples, other statements related to looping – break, continue, GOTO, Simple C Programming examples.

UNIT - III

Designing Structured Programs, Functions, basics, user defined functions, inter function communication, Standard functions, Scope, Storage classes-auto, register, static, extern, scope rules, type qualifiers, recursion- recursive functions, Preprocessor commands, example C programs Arrays – Concepts, using arrays in C, inter function communication, array applications, two – dimensional arrays, multidimensional arrays, C program examples.

UNIT - IV

Pointers – Introduction (Basic Concepts), Pointers for inter function communication, pointers to pointers, compatibility, memory allocation functions, an array of pointers, programming applications, pointers to void, pointers to functions, command –line arguments. Strings – Concepts, C Strings, String Input / Output functions, arrays of strings, string manipulation functions, string / data conversion, C program examples.

UNIT - V

Derived types – Structures – Declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit fields, enumerated types, C programming examples.

UNIT - VI

Input and Output – Concept of a file, streams, standard input / output functions, formatted input / output functions, text files and binary files, file input / output operations, file status functions (error handling), C program examples.

UNIT – VII

Searching and Sorting – Sorting- selection sort, bubble sort, insertion sort, quick sort, merge sort, Searching-linear and binary search methods, Trees: representation, tree traversals.

UNIT - VIII

Data Structures – Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, Stacks-Operations, array and linked representations of stacks, stack application-infix to postfix conversion, postfix expression evaluation, recursion implementation, Queues-operations, array and linked representations.

TEXT BOOKS:

1. B.A. Forouzan and R.F. Gilberg, *C Programming & Data Structures* ,Third Edition, Cengage Learning.
2. J.R.Hanly, Ashok N. Kamthane and A. Ananda Rao, *Programming in C and Data Structures,* Pearson Education.
3. R.G.Dromey, "*How to Solve it by Computer* ", PHI , 1998

REFERENCES:

1. P. Padmanabham*, C& Data structures* – Third Edition, B.S. Publications.
2. B.W. Kernighan and Dennis M.Ritchie, *The C Programming Language* ,PHI/Pearson Education
3. J.A. Jones & K. Harrow, *C Programming with problem solving*,Dreamtech Press
4. Stephen G. Kochan, *Programming in C* , III Edition, Pearson Education.
5. H.Cheng, *C for Engineers and Scientists*, Mc.Graw-Hill International Edition
6. A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, *Data Structures using C* , Pearson Education / PHI
7. P. Dey, M Ghosh R Thereja, *C Programming & Data Structures*, Oxford University Press.
8. E V Prasad and N B Venkateswarlu, *C& Data structures* ,S. Chand&Co.

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I B.Tech.CSE I Year	**L**	**T**	**P**	**C**
	3	**1**	**-**	**6**

12AEE02 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to CSE & IT Branches)

PART-A

Objectives:

1. *To understand the Basic Fundamentals in Electrical Circuits.*
2. *To study the construction, Principle of operation and performance of DC Machine and AC Machine and know Principle of Measuring Instruments.*

Outcomes:

After completion of this course the students will be able to:

1. *Acquire the concept of all types of Electrical Machines like DC Motor, AC Motor, Generators, Alternator, and principles of Measuring Instruments.*

UNIT I

INTRODUCTION TO ELECTRIC CIRCUITS: Circuital element – Sources - Ohm's Law - Kirchhoff's Law - Network reduction Techniques , Mesh analysis and Nodal Analysis –Thevenin's , Norton's, Super Position and Maximum Power Transfer Theorem - Simple Problems - Sinusoidal Alternating Quantities – Concept of Frequency, Period, Phase Average and RMS Values – Concept of Impedance- Simple Problems.

UNIT II

DC MACHINES: Construction - Principle of Operation of EMF Equation - Different Types of Generators - DC Motor Operation – Different Types – torque Equation – Efficiency - Application of DC Machines.

UNIT III

AC MACHINES: Principle of Operation of Single Phase Transformer - EMF Equation – Losses – Efficiency and Regulation - Concept of Three Phase Supply and its Application – Construction – Operation and types of Three Phase Induction Motors - Slip – Torque Characteristics and Application – Principle of Operation of Alternator – Concept of Regulation.

UNIT IV

MEASURING INSTRUMENTS: Principle of Operation of Moving Coil and Moving Iron Types of Meters – Extension of Range of Ammeters and Voltmeters - Principle of Operation of Wattmeter and Energy Meter

PART-B

UNIT V

RECTIFIERS: P and N Type Semiconductors – P and N Junction Diode – Construction and Characteristics - Zener Diode – Characteristics – Rectifier Circuits- Half Wave , Full wave and Bridge Circuits - Filters and Regulators – Concept of SMPS.

UNIT VI

AMPLIFIERS: BJT and FET Characteristics – Biasing - H Parameters Representation – Analysis of Single Stage Amplifier Circuits – Comparison of CE, CC and CB Configuration – Comparison of BJT and FET Amplifiers.

UNIT VII

FEED BACK AMPLIFIER AND OSCILLATORS: Concept of Feedback - Effect of Negative Feedback – Simple feedback Amplifier Circuits - Principle of Operation of Oscillator Circuit – RC Phase shift oscillator.

UNIT VIII

CATHODE RAY OSCILLOSCOPE: Principle of Operation of CRT - Electrostatic and Magnetic Deflection – Applications of CRO for Voltage and Frequency Measurements

TEXT BOOKS:

1. HUGHES: *Electrical and Electronic Technology*, Pearson Publications.
2. Millman and Halkias: *Electronic Devices and circuits*, Tata McGraw Hill Publications

REFRENCE BOOKS:

1. J.P. Nagrath & D. P Kothari: *Basic Electrical Engineering*, PHI Publications.
2. Helfrick and copper: *Modern Electronic Instrumentation and Measurement Techniques*, PHI Publications

NOTE: Answer five questions choosing at least two questions from each part

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	2	**-**	**4**	**6**

12AME01 **Engineering Drawing**

Objectives:

On Completion of the study of this subject studies of objectives should be able to

1. (a). To enhance imagination capacity
(b). Understand the importance of Engg Drawing
2 .(a) Use Engg Drawing instruments and wrote a free hand Lettering.
3. Understand dimensioning practice
4. Apply principles of orthographic projections.
5. Under the need for auxiliary views and sectional views
6. Prepare pictorial drawings.

Outcomes

The student should be able to

1. *Master the Prepare pictorial drawings as per the international standards*
2. *Prepare drawings as per the international standards.*
3. *Communicate his/her ideas globally effectively by using the principles of orthographic projections.*
4. *Prepare the development of surfaces of simple engineering objects.*

UNIT I– INTRODUCTION TO ENGINEERING DRAWING:
Principles of Engineering Graphics and their Significance – Drawing Instruments and their Use – Conventions in Drawing – Lettering – BIS Conventions. Curves used in Engineering Practice – scales.
a) Conic Sections – General method only.
b) Scales – plain and diagonal scales

UNIT II– PROJECTION OF POINTS AND LINES: Principles of Orthographic Projection – Conventions – First Angle Projections. Projections of Points, Lines inclined to one and both planes, Problems on projections, Finding True lengths & True inclinations.

UNIT III– PROJECTIONS OF PLANES: Projections of regular Plane surfaces, Projection of lines and planes using auxiliary planes.

UNIT IV– PROJECTIONS OF SOLIDS: Projections of Regular Solids inclined to one plane.

UNIT V– SECTIONS AND DEVELOPMENTS OF SOLIDS: Section Planes and Sectional views of Right Regular Solids–Prism, Cylinder, Pyramid and Cone. True shapes of the sections.
Development of Surfaces of Right Regular Solids – Prisms, Cylinder, Pyramid and Cone.

UNIT VI– ISOMETRIC PROJECTIONS: Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions – Isometric Views of Lines, Plane Figures, Simple Solids – Isometric Projection of objects having a non- isometric lines. Isometric projections of spherical parts. Conversion of Isometric projections/views to Orthographic Views and vice versa

UNIT VII– INTERPENETRATION OF RIGHT REGULAR SOLIDS: Projections of curves of Intersection of Cylinder Vs Cylinder, Square Prism Vs Square Prism.

UNIT VIII– perspective projections: perspective view: plane and simple solids.

TEXT BOOKS:

1. Engineering Drawing, K.L. Narayana, P. Khanniah, Scitech Publishers

2. Engineering Drawing, N.D. Bhat, Charotar Publishers

REFERENCES:

1. Engineering Drawing, Johle, Tata McGraw-Hill

2. Engineering Drawing, Shah and Rana, 2/e, Pearson Education

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	0	**0**	**3**	**4**

12AHS05 ENGINEERING PHYSICS AND ENGINEERING CHEMISTRY LAB (Common to all Branches)

ENGINEERING PHYSICS LAB:

A minimum of 10 experiments to be conducted during the academic year

1. Determination of wavelength of given light source - Spectrometer.
2. Dispersive power of prism
3. Determination of wavelength of laser – Diffraction grating.
4. Determination of particle size by using laser
5. Determination of thickness of thin wire by producing parallel fringes.
6. Newton Rings.
7. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
8. Numerical Aperture of an optical fiber.
9. Bending losses in Optical Fiber.
10. Determination of wavelength of IR source using optical fiber.
11. Determination of Hall Coefficient and Carrier concentration in the given Semiconductor.
12. B-H curve.
13. Energy gap of a semiconductor.
14. Determination of Dielectric constant.

ENGINEERING CHEMISTRY LAB:

1. Preparation of Standard Potassium Dichromate solution and Estimation of Ferrous Ion.
2. Estimation of Copper by Iodometry.
3. Estimation of Hardness of Water by EDTA method.
4. Estimation of Copper by EDTA method
5. Determination of Chemical Oxygen Demand
6. Estimation of Dissolved oxygen
7. Determination of strength of the given Hydrochloric acid using standard sodium hydroxide solution by Conductometric titration
8. Determination of viscosity of oils through Redwood viscometer
9. Determination of calorific value of a fuel using Bomb calorimeter
10. Determination of Eutectic Temperature of binary system (Urea – Benzoic Acid)

EXAMINATION PATTERN

Evaluation is made separately in both the laboratories and average of the marks obtained in both the laboratories is considered for awarding marks in internals and end examination.

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12ACS02 **Computer Programming Lab**
(Common to all Branches)

Week I.

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

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

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

Week 2.

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

Sum=1-x2/2! +x4/4!-x6/6!+x8/8!-x10/10!

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

Week 3

a) Write C programs that use both recursive and non-recursive functions

i) To find the factorial of a given integer.

ii) To find the GCD (greatest common divisor) of two given integers.

iii) To solve the Towers of Hanoi problem.

Week 4

a) The total distance travelled by the vehicle in 't' seconds is given by distance = ut+1/2at2 where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec2). Write a C program to find the distance travelled at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.

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

Week 5

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

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

i) Addition of Two Matrices

ii) Multiplication of Two Matrices

Week 6

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

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

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

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

Week 7

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

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

Week 8

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

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

Week 9

Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:

$1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$

For example: if n is 3 and x is 5, then the program computes 1+5+25+125.

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

Week 10

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

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

Week 11

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

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

iv) Multiplication of two complex numbers

(Note: represent complex number using a structure.)

Week 12

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

b) Write a C program to reverse the first n characters in a file.

(Note: The file name and n are specified on the command line.)

Week 13

a) Write a C program to display the contents of a file.

b) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file)

Week 14

Write a C program that uses functions to perform the following operations on singly linked list.:

i) Creation ii) Insertion iii) Deletion iv) Traversal

Week 15

Write C programs that implement stack (its operations) using

i) Arrays ii) Pointers

Week 16

Write C programs that implement Queue (its operations) using

i) Arrays ii) Pointers

Week 17

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

i) Converting infix expression into postfix expression

ii) Evaluating the postfix expression

Week 18

Write a C program that implements the following sorting methods to sort a given list of integers in ascending order

i) Bubble sort

ii) Selection sort

Week 19

Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers :

i) Linear search ii) Binary search

Week 20

Write a C program that implements the following sorting method to sort a given list of integers in ascending order:

i) Quick sort

Week 21

Write a C program that implements the following sorting method to sort a given list of integers in ascending order:

i) Merge sort

Week 22

Write C programs to implement the Lagrange interpolation and Newton- Gregory forward interpolation.

Week 23

Write C programs to implement the linear regression and polynomial regression algorithms.

Week 24

Write C programs to implement Trapezoidal and Simpson methods.

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12AME02 ENGINEERING & IT WORKSHOP

1. **TRADES FOR EXERCISES**:

a. Carpentry shop– Two joints (exercises) involving tenon and mortising, groove and tongue: Making middle lap T joint, cross lap joint, mortise and tenon T joint, Bridle T joint from out of 300 x 40 x 25 mm soft wood stock

b. Fitting shop– Two joints (exercises) from: square joint, V joint, half round joint or dove tail joint out of 100 x 50 x 5 mm M.S. stock

b. Sheet metal shop– Two jobs (exercises) from: Tray, cylinder, hopper or funnel from out of 22 or 20 guage G.I. sheet

c. House-wiring– Two jobs (exercises) from: wiring for ceiling rose and two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp, wiring for a water pump with single phase starter.

d. Foundry– Preparation of two moulds (exercises): for a single pattern and a double pattern.

e. Welding – Preparation of two welds (exercises): single V butt joint, lap joint, double V butt joint or T fillet joint

2. TRADES FOR DEMONSTRATION:

a. Plumbing

b. Machine Shop

c. Metal Cutting

Apart from the above the shop rooms should display charts, layouts, figures, circuits, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, Plastics, steels, meters, gauges, equipment, CD or DVD displays, First aid, shop safety etc. (though they may not be used for the exercises but they give valuable information to the student). In the class work or in the examination knowledge of all shop practices may be stressed upon rather than skill acquired in making the job.

REFERENCE BOOKS:

1. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers.
2. Engineering Practices Lab Manual, Jeyapoovan, Saravana Pandian, 4/e Vikas
3. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.

I.T. WORKSHOP

Objectives:

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

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 a working PC (PIV or higher)to disassemble and assemble back 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 for usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.

Productivity tools module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools and LaTeX. (It is 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 shall 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.

OFFICE TOOLS

LaTeX and Word

Exercise 7 – Word Orientation: The mentor needs to give an overview of LaTeX and Microsoft (MS) office 2007/ equivalent (FOSS) tool word: Importance of LaTeX and MS office 2007/ equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Task 1 : Using LaTeX and Word 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, Using Date and Time option in both LaTeX and Word.

Excel

Exercise 8 - Excel Orientation: The mentor needs to tell the importance of MS office 2007/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1: Creating a Scheduler - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text

LaTeX and MS/equivalent (FOSS) tool Power Point

Exercise 9 - Task1: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this Exercise includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Powerpoint. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

Exercise 10 - Task 2 : Second Exercise helps students in making their presentations interactive. Topic covered during this Exercise includes : Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts

Internet & World Wide Web

2 Exercises

Exercise 11 - 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.

Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers.

Exercise 12 - Task 2: **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 by the student to the satisfaction of the instructors.

Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computers to be safe on the internet. They need to first install an anti virus software, configure their personal firewall and windows update on their computer.

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	-	**-**	**3**	**4**

12AHS06 ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

SYLLABUS:

The following course content is prescribed for the **English Language Laboratory** sessions.

1. Introduction to the Sounds of English- Vowels, Diphthongs & Consonants.
2. Introduction to Stress and Intonation.
3. Situational Dialogues (giving directions etc.)
4. Speaking on the mobiles and telephone conversation
5. Role play.
6. Oral Presentations-Prepared and Extempore.
7. 'Just A Minute' Sessions (JAM)
8. Describing Objects/ Situations/ People.
9. Information Transfer
10. Debate.

Minimum Requirement:

The English Language Lab shall have two parts:

1. **The computer aided Language Lab** for 60 students with 60 systems, one master console, LAN facility and English language software for self-study by learners.
2. **The communication Skills Lab** with movable chairs and audio-visual aids with P.A system, a T.V., a digital stereo- audio & video system and camcorder etc.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

i) P-IV Processor

a) Speed – 2.8 GHZ

b) RAM – 512 MB Minimum

c) Hard Disk – 80 GB

ii) Headphones of High quality.

PRESCRIBED SOFTWARE: GLOBARENA

Suggested Software:

- Cambridge Advanced Learners English Dictionary with CD.
- The Rosetta Stone English Library.
- Clarity Pronunciation Power- Part I
- Mastering English in Vocabulary, Grammar, Spellings, and Composition.
- Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- Language in Use, Foundation Books Pvt Ltd with CD
- Learning to Speak English – 4 CDs
- Microsoft Encarta with CD
- Murphy's English Grammar, Cambridge with CD
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.

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II B.Tech CSE – I Semester	**L**	**T**	**P**	**C**
	4	**1**	**0**	**4**

12AHS07 ENGINEERING MATHEMATICS-II

(Common to all branches)

Objectives:

1. *To develop the basic concepts of Matrices, interpolation, partial differential equations and finite series.*
2. *To appreciate the applications of PDE to engineering problems.*

Outcomes:

After completion of the course the student will be able to

1. *Conversant with the basics of matrices, PDEs, finite series etc.*
2. *Model and solve different engineering problems with the above concepts.*

UNIT-I

MATRICES: Rank of a matrix-Echelon form, Normal form-solution of linear system of homogeneous and non-homogeneous equations-direct methods-Gauss elimination, Guass-Jordan methods.

UNIT-II

EIGEN VALUES AND EIGEN VECTORS - Eigen values and Eigen vectors- Inverse and powers of a matrix by Cayley-Hamilton theorem-Linear Transformations-Orthogonal transformations-Diagonalization of a matrix. Quadratic forms-Reduction of Quadratic form to canonical form and their nature.

UNIT-III

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: Introduction-The Bisection method-The method of false position-The Iteration method-Newtons-Raphson method

INTERPOLATION: Forward Differences-backward differences-Newton's forward and backward differences formulae for interpolation-Lagrange's interpolation formula-Inverse interpolation .

UNIT-IV

CURVE FITTING: Fitting a straight line-Second degree curve-Exponential curve-Power curve by method of least squares. Numerical Differentiation and integration-Trapezoidal rule - Simpson's 1/3 rule.

UNIT-V

NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS: solution by Taylor's series-Picard's method of successive Approximations-Euler's Method – Runge-Kutta Methods-Predictor-corrector method-Milne's method.

UNIT-VI

FOURIER SERIES: Determination of Fourier Coefficients--Even and odd functions-
Fourier series in an arbitrary interval- periodic continuous functions-Half-range
Fourier sine and cosine expansions. Fourier integral theorem (statement) -Fourier sine and cosine integrals. Fourier Transforms-Fourier sine and cosine Transforms.- -Inverse transforms-Finite Fourier transforms.

UNIT-VII

PARTIAL DIFFERENTIAL EQUATIONS: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions.-Method of separation of variables-solution of one dimensional wave equation, heat equation and two –dimensional Laplace's equation under initial boundary conditions.

UNIT-VIII

Z-TRANSFORMS: Inverse Z- transforms-Properties-Damping rule-Shifting rule-Initial and final value theorems. Convolution theorem- Solution of difference equations by Z- transforms.

Text Books:

1. Iyengar T.K.V., Krishna Gandhi.B and others, *Mathematical Methods*, New Delhi, S.Chand & company,2012.
2. Sankar rao G.,Kesav Reddy.E, *Mathematical Methods*, International publishing house,Pvt.ltd
3. Ranganatham.S,Prasad M.S.S.N.,Ramesh Babu.V, *Numerical Analysis,* S.Chand & company
4. Sankaraiah .C*, Mathematical Methods*, Vijayawada,V.G.S Book links,2007.

References:

1. Jain.M.K, IyengarT.K.V,.Jain.R.K. *Numerical Methods for Scientific and Engineering Computation.* Newage International publishers.
2. Pal, *Mathematical Methods* ,Oxford University Press,2009.
3. Sastry .S.S., *Introduction to Numerical analysis*.New Delhi,Prentice Hall of India,2003
4. Erwin Kreyszig *,Advanced Engineering Mathematics.* John Wiley & Sons.
5. Dr..Grewal .B.S, *Higher Engineering Mathematics*,New Delhi,Khanna Publishers,2004

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II-B.Tech CSE –I Semester

L	T	P	C
4	1	0	4

12AHS09 ENVIRONMENTAL SCIENCE
(Common to ECE IT and CSE)

Objectives:

1. *To create awareness about environmental problems and find the solutions to solve the problems.*
2. *To motivate the public to participate in the environmental protection to free man from all sorts of pollutions.*
3. *To know global atmospheric changes and inculcate the public to conserve and to use the natural resources judiciously.*

Outcomes:

After completion of the course the student will be able to

1. *Aware of how to conserve the natural resources*
2. *They will be aware of maintaining the ecological balance based on the cultural and biological diversity*
3. *They will find solutions to solve the different varieties of environmental problems.*

UNIT-I

MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES: Definition, Scope and Importance – Need for Public Awareness.

UNIT-II

NATURAL RESOURCES: Renewable and non-renewable resources-Natural resources and associated problems: Forest resources**:** Use and over-exploitation, deforestation, case studies – Timber extraction, Mining, Dams and other effects on forest and tribal people .Water resources**:** Use and over utilization of surface and ground water , Floods, Drought, conflicts over water, dams-benefits and problems. Mineral resources**:** Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources**:** Renewable and Non-renewable energy resources

UNIT-III

ECOSYSTEMS: Concept of an ecosystem, Structure and function of an ecosystem – Producers, Consumers and decomposers – Energy flow in the ecosystem –Ecological Succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:
a.Forest ecosystem b. Grassland ecosystem c. Desert ecosystem
d.Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT-IV

BIODIVERSITY AND ITS CONSERVATION: Introduction, Definition, Types of biodiversity(genetic, species and ecosystem diversity)-Bio-geographical classification of India-Value of biodiversity(Consumptive use, Productive use, Social use, Ethical use, Aesthetic and Option values)-Biodiversity at global, national and local levels-India as a mega diversity nation-Hot spots of biodiversity-Threats to biodiversity(habitat loss, Poaching of wildlife, man-wildlife conflicts)-Endangered and endemic species of India-Conservation of biodiversity(In-situ and Ex-situ conservation of biodiversity).

UNIT-V

ENVIRONMENTAL POLLUTION: Definition, causes, effects and control measures of:
a.Air Pollution b. Water Pollution c. Soil Pollution d. Marine Pollution e. Noise Pollution f. Thermal Pollution g. Nuclear hazards
Solid Waste Management**:** Causes, effects and control measures of urban and industrial wastes-Role of an individual in prevention of pollution-Pollution case studies-Disaster management: Floods, Earthquake, Cyclone and Landslides.

UNIT-VI

SOCIAL ISSUES AND THE ENVIRONMENT: From Unsustainable to sustainable development-Urban problems related to energy-Water conservation(rainwater harvesting, watershed management)-Resettlement and rehabilitation of people; its problems and concerns, case studies-Environmental ethics: Issues and possible solutions-Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies-Wasteland reclamation-Consumerism and waste products-Environment Protection Act-Air(Prevention and Control of Pollution) Act-Water (Prevention and control of Pollution) Act-Wildlife Protection Act-Forest Conservation Act-Issues involved in enforcement of environmental legislation-Public awareness.

UNIT-VII

HUMAN POPULATION AND THE ENVIRONMENT: Population growth, variation among nation, Population explosion-Family Welfare Programme-Environment and human health-Human Rights-Value Education-HIV/AIDS-Women and Child Welfare-Role of Information Technology in Environment and human health-Case studies.

UNIT-VIII

FIELD WORK: Visit to a local area to document environmental assets
River/forest/grassland/hill/mountain-Visit to a local polluted site-Urban/rural Industrial/ Agricultural Study of common plants, insects, birds-river, hillslopes etc.

Text Books:

1. Mukkanti.k, *Textbook of Environmental Studies,* S.Chand *publications*
2. Erach Bharucha , *Textbook of Environmental Studies* for Undergraduate courses by from UGC.
3. Dr.Raghavan Nambiar.K, Text Book of *Environmental Studies,Sitech publications,2010.*
4. Benny Joseph, *Environmental Studies* by Mc.GrawHill Publications,2010.

References:

1. Dr.Suresh.K.Dhameja, *Environmental Studies,* S.K. Kataria & Sons Publishers,2012.
2. Sharma. J.P., *Comprehensive Environmental Studies*, Laxmi Publications,2010.

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12ACS03 **ADVANCED DATA STRUCTURES**
(Common to CSE & IT)

Objectives:

1. Introduce new & advanced data structures
2. Introduce algorithmic design and analysis
3. Solve problems using different data structures and design techniques
4. Implement algorithms and data structures in C++

Outcomes:

At the end of the subject, students will be able to:

1. *Understand the properties of various data structures;*
2. *Understand basic techniques of algorithm analysis*
3. *Understand advanced abstract data type (ADT) and data structures and their implementations,*

Unit I :
C++ Class Overview- Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling.

Unit II :
Function Over Loading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.

Unit III :

Algorithms, performance analysis- time complexity and space complexity. Review of basic data structures- The list ADT, Stack ADT, Queue ADT, Implementation using template classes in C++.

Unit IV :
Dictionaries, linear list representation, skip list representation, operations insertion, deletion and searching, hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing,
extendible hashing, comparison of hashing and skip lists.

Unit V :

Priority Queues – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, External Sorting- Model for external sorting, Multiway merge, Polyphase merge.

Unit VI :

Search Trees (Part1):- Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching

Unit VII :

Search trees (part II) : Introduction to Red –Black and Splay Trees, B-Trees, B-Tree of order m, the height of a B-Tree, insertion, deletion and searching, Comparison of Search Trees

Unit VIII :

Pattern matching and Tries : Pattern matching algorithms-Brute force, the Boyer –Moore algorithm, the Knuth-Morris-Pratt algorithm, Standard Tries, Compressed Tries, Suffix tries.

TEXT BOOKS :

1. S.Sahni, *Data structures, Algorithms and Applications in C++,* University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
2. Michael T.Goodrich, R.Tamassia and Mount, *Data structures and Algorithms in C++* , Wiley student edition, John Wiley and Sons.

REFERENCES :

1. Mark Allen Weiss ,*Data structures and Algorithm Analysis in C++,* Pearson Education. Ltd., Second Edition.
2. Adam Drozdek, *Data structures and algorithms in C++*, 3rd Edition , Thomson
3. Langsam, Augenstein and Tanenbaum, *Data structures using C and C++*, PHI.
4. W.Savitch*, Problem solving with C++, The OOP*, Fourth edition, Pearson education.

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12AEC08 DIGITAL LOGIC DESIGN

(Common to CSE & IT)

Objectives:

The objective of the course is to

1. *Explain how digital circuit of large complexity can be built in a methodological way, starting from Boolean logic and applying a set of rigorous techniques.*
2. *Create minimal realizations of single and multiple output Boolean functions.*
3. *Design and analyze combinational circuits using medium scale integrated (MSI) components, including arithmetic logic units.*

Outcomes:

On successful completion of this course students will be able to

1. *Design and analyze combinational and sequential circuits for various practical problems using basic gates and Flip Flops*
2. *Implement LSI and MSI circuits using programmable logic devices (PLDs).*
3. *Demonstrate knowledge of hazards and race conditions generated within asynchronous circuits.*

UNIT-I

BINARY SYSTEMS: Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complement, Signed binary numbers, Binary codes, Binary Storage and Registers and Binary logic.

UNIT-II

BOOLEAN ALGEBRA AND LOGIC GATES : Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions canonical and standard forms, other logic operations, Digital logic gates and Integrated circuits.

UNIT-III

GATE – LEVEL MINIMIZATION: The map method, Four-variable map, Five-Variable map, product of sums simplification, Don't-care conditions, NAND and NOR implementation, other Two-level implementations and Exclusive–OR function.

UNIT - IV

COMBINATIONAL LOGIC : Combinational Circuits, Analysis procedure, Design procedure, Binary Adder and Subtractor, Decimal Adder, Binary multiplier, magnitude comparator, Decoders, Encoders and Multiplexers.

UNIT - V

SYNCHRONOUS SEQUENTIAL LOGIC: Sequential circuits, Latches, Flip-Flops, Analysis of clocked sequential circuits, State Reduction and Assignment, Design Procedure**.**

UNIT – VI

REGISTERS AND COUNTERS:

Shift Registers, Ripple counters, synchronous counters and Design of modulo-N Counters, Ring and Johnson Counters.

UNIT – VII

MEMORIES:

Random-Access Memory, Memory Decoding, Error Detection and correction, Read-Only Memory, Programmable Logic Array(PLA), Programmable Array Logic(PAL), Sequential Programmable Devices.

UNIT-VIII

ASYNCHRONOUS SEQUENTIAL LOGIC : Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and Flow Tables, Race-Free state Assignment Hazards and Design Example.

TEXT BOOKS :

1. M.Morris Mano and Michael D.Ciletti, *Digital Design*, Fourth Edition, Pearson Education.
2. Charles Roth, *Fundamentals of Logic Design*, 5th Edition, Thomson.

REFERENCES :

1. Zvi. Kohavi, *Switching and Finite Automata Theory*, Tata McGraw Hill.
2. C.V.S. Rao, *Switching Theory and Logic Design*, Pearson Education.
3. Donald D.Givone, *Digital Principles and Design*, Tata McGraw Hill.
4. M. Rafiquzzaman, *Fundamentals of Digital Logic & Micro Computer Design*, 5th Edition, John Wiley.

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12ACS04 **UNIX Shell Programming**

Objectives:

1. *State how the shell functions at the user interface and command line interpreter.*
2. *Modify built-in shell variables and create and use user-defined shell variables.*
3. *Use I/O redirection, pipes, quoting, and filename expansion mechanisms.*

Outcomes:

At the end of the subject, students will be able to:

1. *Understand the various UNIX Commands.*
2. *Acquire good programming knowledge in various Shells Environments.*
3. *Gain knowledge in shell programs which process interrupts, pass signals, invoke sub-shells and functions, and trap signals.*

Unit I:

Introduction to Unix:- Architecture of Unix, Features of Unix , Unix Commands – PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip.

Unit II :

Unix Utilities:-Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin.Text processing utilities and backup utilities , detailed commands to be covered are tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr

Unit III :

Introduction to Shells : Unix Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization.

Filters : Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count characters, Words or Lines, Comparing Files.

Unit IV :

Grep : Operation, grep Family, Searching for File Content.

Sed : Scripts, Operation, Addresses, commands, Applications, grep and sed.

Unit V :

Awk: Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications, awk and grep, sed and awk.

Unit VI :

Interactive KornShell : Korn Shell Features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, Options, Startup Scripts, Command History, Command Execution Process.

Korn Shell Programming : Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

Unit VII :

Interactive C Shell :C shell features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, On-Off Variables, Startup and Shutdown Scripts, Command History, Command Execution Scripts.

C Shell Programming : Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

Unit VIII :

File Management : File Structures, System Calls for File Management – create, open, close, read, write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir, closedir, mkdir, rmdir, umask.

TEXT BOOKS :

1. Behrouz A. Forouzan, Richard F. Gilberg,*Unix and shell Programming*,Thomson

2. SumitabhaDas,*Your Unix the ultimate guide*, TMH. 2nd Edition.

REFERENCES :

1. Graham Glass, King Ables, *Unix for programmers and users*, 3rd edition, Pearson Education.

2. Kernighan and Pike,*Unix programming environment*, PHI. / Pearson Education

3. Rosen, Host, Klee, Farber, Rosinski, *The Complete Reference Unix*, Second Edition, TMH.

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12AHS08 PROBABILITY AND STATISTICS

(Common to ME and CSE)

Objectives:

1. *To revise elementary concepts and techniques*
2. *To formalize the knowledge of theory of probability, random variables, probability distributions and different techniques of statistical methodologies.*
3. *To apply the above concepts to data analysis.*

Outcomes:

1. *The student is able to sample the data and analyze it.*
2. *Able to optimize a function with two or more variables.*
3. *Student is able to apply suitable tests and evaluate the acceptance of the hypothesis.*

UNIT-I

PROBABILITY: Sample space and events – Probability - The axioms of probability – Some elementary theorems – Conditional probability – Baye's theorem.

UNIT-II

RANDOM VARIABLES: Discrete and Continuous random variables – Distribution Functions – Moment generating functions.

UNIT-III

DISTRIBUTIONS: Binomial Distribution – Poisson Distribution – Normal Distribution – related properties.

UNIT-IV

SAMPLING DISTRIBUTIONS: Populations and Samples – Sampling distributions of mean (known and unknown) proportions, sums and difference.

UNIT-V

ESTIMATION: Point Estimation – Interval estimation – Bayesian estimation.

UNIT-VI

TESTS OF HYPOTHESIS: Type I error and Type II errors, One tail, two tail tests - Hypothesis concerning one and two means – Hypothesis concerning one and two proportions.

UNIT-VII

TEST OF SIGNIFICANCE : Student- t-test, F-test, Chi-square **[χ^2]** test**:** χ^2 test goodness of fit – the analysis of RxC tables

UNIT-VIII

QUEUING THEORY: Pure Birth and Death process- M/M/1 Model – Problems on M/M/1 Model.

Text Books:

1. Iyengar. T.K.V., Krishna Gandhi B., *Probability & Statistics*, New Delhi,S.Chand & Company,2012.

2. Shahnaz Bathul, *A text book of Probability & Statistics*, Vijayawada,V.G.S.Books links,2010.

References:

1. Miller and John Freund. E., *Probability & Statistics for Engineers,* New Delhi, Pearson Education,2004.

2. Arnold O Allen ,*Probability & Statistics*, , Academic Press

3.Ahmed Waheedullah, Ahmed Mohiuddin.M, Sulthan Ali, *Probability & Statistics,* Hyd,Hitech Publishers,2006.

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12ACS05 **Data Structures Lab**
(Common to CSE & IT)

Week 1- C++ programs to implement the following using an array.
a) Stack ADT b) Queue ADT

Week 2- Write C++ programs to implement the following using a singly linked list.
a) Stack ADT b) Queue ADT

Week 3- Write C++ programs to implement the dequeue (double ended queue) ADT using a doubly linked list and an array.

Week 4-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.

Week 5-. Write C++ programs that use non-recursive functions to traverse the given binary tree in
a) Preorder b) inorder and c) postorder.

Week 6-.Write C++ programs for the implementation of bfs and dfs for a given graph.

Week 7- Write C++ programs for implementing the following sorting methods:
a) Merge sort b) Heap sort

Week 8-.Write a C++ program to perform the following operations
a) Insertion into a B-tree b) Deletion from a B-tree

Week 9-. Write a C++ program to perform the following operations
a) Insertion into an AVL-tree b) Deletion from an AVL-tree
Week 10-Write a C++ program to implement Kruskal s algorithm to generate a Minimum cost spanning tree.

Week 11-Write a C++ program to implement Prim's algorithm to generate a minimum cost spanning tree.

Week 12-. Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.
(Note: Use Class Templates In the above Programs)

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12ACS06 **UNIX Shell Programming Lab**

Week1

Session-1
a) Log into the system
b) Use vi editor to create a file called myfile.txt which contains some text.
c) Correct typing errors during creation.
d) Save the file
e) Logout of the system
Session-2
a) Log into the system
b) Open the file created in session 1
c) Add some text
d) Change some text
e) Delete some text
f) Save the Changes
g) Logout of the system

Week2

a) Log into the system
b) Use the cat command to create a file containing the following data. Call it mytable use tabs to separate the fields.

1425	Ravi	15.65
4320	Ramu	26.27
6830	Sita	36.15
1450	Raju	21.86

c) Use the cat command to display the file, mytable.
d) Use the vi command to correct any errors in the file, mytable.
e) Use the sort command to sort the file mytable according to the first field. Call the sorted file my table (same name)
f) Print the file mytable
g) Use the cut and paste commands to swap fields 2 and 3 of mytable. Call it my table (same name)
h) Print the new file, mytable
i)Logout of the system.

Week3

1) a) Login to the system
b) Use the appropriate command to determine your login shell
c) Use the /etc/passwd file to verify the result of step b.
d) Use the who command and redirect the result to a file called myfile1. Use the more command to see the contents of myfile1.
e) Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2. Use the more command to check the contents of myfile2.

2) a) Write a sed command that deletes the first character in each line in a file.
b) Write a sed command that deletes the character before the last character in each line in a file.
c) Write a sed command that swaps the first and second words in each line in a file.

Week4

a) Pipe your /etc/passwd file to awk, and print out the home directory of each user.
b) Develop an interactive grep script that asks for a word and a file name and then tells how many lines that contain word.

Week5

a) Write a shell script that takes a command –line argument and reports on whether it is a directory, a file, or something else.
b) Write a shell script that accepts one or more file name as arguments and converts all of them to upper case, provided they exist in the current directory.
c) Write a shell script that determines the period for which a specified user is working on the system.

Week6

a) 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.

b) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

Week7

a) Write a shell script that computes the gross salary of a employee according to the following rules:
i)If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic.
ii) If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic
The basic salary is entered interactively through the keyboard.
b) Write a shell script that accepts two integers as its arguments and computes the value of the first number raised to the power of the second number.

Week8

a) Write an interactive file-handling shell program. Let it offer the user the choice of copying, removing, renaming, or linking files. Once the user has made a choice, have the program ask the user for the necessary information, such as the file name, new name and so on.

b) Write shell script that takes a login name as command – line argument and reports when that person logs in

c) Write a shell script which receives two file names as arguments. It should check whether the two file contents are same or not. If they are same then second file should be deleted.

Week9

a) 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.

b) Develop an interactive script that asks for a word and a file name and then tells how many times that word occurred in the file.

c) Write a shell script to perform the following string operations:

i) To extract a sub-string from a given string.

ii) To find the length of a given string.

Week10

Write a C program that takes one or more file or directory names as command line input and reports the following information on the file:

i) File type ii) Number of links

iii) Read, write and execute permissions

iv) Time of last access

(Note : Use stat/fstat system calls)

Week11

Write C programs that simulate the following unix commands:

a) mv b) cp (Use system calls)

Week12

Write a C program that simulates ls Command (Use system calls / directory API)

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12ACS07 **COMPUTER ORGANIZATION**
(Common to CSE & IT)

Objectives:

1. *This course provides a discussion of the fundamentals of computer organization (physical design) and architecture (logical design) and relates this to contemporary design issues.*
2. *This will cover machine level representation of data, assembly level organization, memory system organization and architecture, system connection, memory, input/output, instruction sets, CPU structure and functions and the control Unit operation.*
3. *Develop independent learning skills and be able to learn more about different computer architectures and hardware*

Outcomes:

Students successfully completing the course will be able to:

1. *Describe computer architecture and organization, computer arithmetic, and CPU design*
2. *Describe I/O system and interconnection structures of a computer*
3. *Use assembly language to program a microprocessor system*

UNIT I :

BASIC STRUCTURE OF COMPUTERS: Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Data Representation.Fixed Point Representation. Floating – Point Representation. Error Detection codes.

UNIT II :

REGISTER TRANSFER LANGUAGE AND MICRO OPERATIONS: Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Mircrooperatiaons, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions, Instruction cycle

UNIT III :

Memory Reference Instructions, Input – Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer.

UNIT IV :

MICRO PROGRAMMED CONTROL: Control memory, Address sequencing, microprogram example, the design of the control unit Hard wired control. Microprogrammed control

UNIT V :

COMPUTER ARITHMETIC: Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations. Decimal Arithmetic unit Decimal Arithmetic operations.

UNIT VI:

THE MEMORY SYSTEM : Basic concepts semiconductor RAM memories. Read-only memories Cache memory performance considerations, Virtual memories secondary storage. Introduction to RAID.

UNIT-VII

INPUT-OUTPUT ORGANIZATION : Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt Direct memory Access, Input –Output Processor (IOP) Serial communication; Introduction to peripheral component, Interconnect (PCI) bus. Introduction to standard serial communication protocols like RS232, USB, IEEE1394.

UNIT VIII :

PIPELINE AND VECTOR PROCESSING : Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline Vector Processing, Array Processors.

MULTI PROCESSORS : Characteristics or Multiprocessors, Interconnection Structures, Interprocessor Arbitration. Interprocessor Communication and Synchronization Cache Coherance.Shared Memory Multiprocessors.

TEXT BOOKS :

1. Carl Hamacher, ZvonksVranesic, SafeaZaky, *Computer Organization*, 5th Edition, McGraw Hill.

2. M.MorisMano, *Computer Systems Architecture*, 3rd Edition, Pearson/PHI

REFERENCES :

1. William Stallings, *Computer Organization and Architecture* –Sixth Edition, Pearson/PHI

2. Andrew S. Tanenbaum, *Structured Computer Organization,* 4th Edition PHI/Pearson

3. Sivaraama Danda mudi,*Fundamentals of Computer Organization and Design*, Springer Int.Edition.

4. John L. Hennessy and David A. Patterson, *Computer Architecture a quantitative approach,*Fourth Edition, Elsevier

5. Joseph D. Dumas ,*Computer Architecture: Fundamentals and principles of Computer Design,*II Edition, BS publication.

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12ACS08 DISCRETE MATHEMATICS FOR COMPUTER SCIENCE

Objectives:

1. *Mathematics for Computing introduces and studies (with an emphasis on problem solving) many of the fundamental ideas and methods of discrete mathematics that are the tools of the computer scientist.*
2. *The course demonstrates the importance of discrete mathematics for computer science.*
3. *Develop an understanding of mathematical logic, functions and relations.*

Outcomes:

1. *On successful completion of this course, students will gain greater knowledge of some key areas of discrete mathematics.*
2. *Students will develop mathematical skills, analytical and critical thinking abilities, and ability to apply these capabilities to practical problems, and your ability to communicate your knowledge of these areas.*
3. *Students will gain good knowledge in recurrence relations, graph theory.*

UNIT-I

Mathematical Logic: Statements and notations, Connectives, Well-formed formulas, Truth Tables, tautology, equivalence implication, Normal forms.

UNIT-II

Predicates : Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT-III

Relations: Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse diagram. Functions: Inverse Function Comports of functions, recursive

Functions, Lattice and its Properties .

UNIT-IV

Algebraic structures : Algebraic systems Examples and general properties, Semi groups and monads, groups sub groups homomorphism, Isomorphism.

UNIT-V

Elementary Combinatorics: Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion Exclusion. Pigeon hole principles and its application.

UNIT-VI

Recurrence Relation : Generating Functions, Function of Sequences Calculating Coefficient of generating functions, Recurrence relations, Solving recurrence relation by substitution and Generating funds. Characteristics roots solution of Inhomogeneous Recurrence Relation.

UNIT-VII

Graph Theory : Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs.

UNIT-VIII

Graph Theory and Applications, Basic Concepts Isomorphism and Subgraphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers.

TEXT BOOKS :

1. CL Liu, D P Mohapatra ,*Elements of DISCRETE MATHEMATICS-A computer oriented approach*, 3rded TMH
2. JL Mott, A Kandel,TPBaker, *Discrete mathematics for computer scientists & mathematicians*, PHI.

REFERENCES :

1. Thomas Koshy, *Discrete Mathematics with Applications*, Elsevier
2. Roberty C. Busby, SharnCutter Ross ,BernandKolman, *Discrete Mathematical Structures,* Pearson Education/PHI
3. Malik&Sen, *Discrete Mathematical structures Theory and application*
4. Garry Haggard and others ,*Discrete Mathematics for Computer Science*, Thomson.
5. J.L. Mott, A.Kandel,T.P. Baker,*Discrete Mathematics for Computer Scientists & Mathematicians,*Prentice Hall.

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12AEC16 MICROPROCESSORS AND INTERFACING
(Common to CSE & IT)

Objectives:

1. To familiarize the architecture of 8086 processor, Assembly language programming and interfacing with various peripherals.
2. To provide the knowledge of 8051 microcontroller concepts, architecture and programming.
3. To understand and design microprocessor based systems for various applications.

Outcomes:

After completion of this course the student will be able to:

1. Study and understand the architecture and programming of any other microprocessor or microcontroller.
2. Do any type of VLSI, Embedded systems, Industrial and real time application.

UNIT-I:
8086: MICRO PROCESSOR
History of Microprocessors, Memory Segmentation, 8086 Microprocessor: Architecture, special functions of general purpose registers, flag register and functions of flags, addressing modes and instruction set of 8086.

UNIT-II:
ASSEMBLY LANGUAGE PROGRAMING
Assembler directives, procedures and macros. Assembly language programs (8086) with assembler directives for addition, subtraction, multiplication, division, sorting, searching, bit manipulation and programs using look-up tables.

UNIT-III:
INTERFACING MEMORY
Pin diagram of 8086-Minimum mode and maximum mode of operation. Timing diagram. Memory Interfacing to 8086 (Static RAM & EPROM). Need for DMA. DMA data transfer Method and Interfacing with 8237/8257.

UNIT-IV:
INTERFACING I/O PORTS AND APPLICATIONS
8255 PPI – various modes of operation and interfacing to 8086. Interfacing Keyboard, Displays, 8279 Stepper Motor and actuators. D/A and A/D converter interfacing.

UNIT-V:
INTERRUPTS
Interrupt structure of 8086. Vector interrupt table. Interrupt service routines. Introduction to DOS and BIOS interrupts. 8259 PIC Architecture and interfacing cascading of interrupt controller and its importance.

UNIT-VI
SERIAL DATA TRANSFER
Serial Data Transfer Schemes, Asynchronous and Synchronous Data Transfer schemes. 8251 USART architecture and interfacing. TTL to RS 232C and RS232C to TTL conversion. Sample program of serial data transfer. Introduction to High-speed serial communications standards and USB.

UNIT-VII
ADVANCED MICRO PROCESSORS
Introduction to 80286, Salient Features of 80386, Real and Protected Mode Segmentation & Paging, Salient Features of Pentium, Branch Prediction and Overview of RISC Processors.

UNIT-VIII:

8051 MICROCONTROLLER:

8051 Microcontroller Architecture, Register set of 8051, Modes of Timer Operation, Serial Port Operation, Interrupt Structure of 8051, Memory and I/O Interfacing of 8051.

TEXT BOOKS:

1. A.K.Ray and K.M.Bhurchandi, *Advanced Microprocessor and Peripherals*, TMH, 2000.
2. Deshmukh, *Micro Controllers*, Tata McGraw Hill Edition.

REFERENCES:

1. Douglas V. Hall, *Micro Processors & Interfacing*, 2007.
2. Walter A.Triebel & Avtar Singh, The 8088 and 8086 Micro Processors – PHI, 4th Edition, 2003.
3. Liu and G.A. Gibson, *Micro Computer System 8086/8088 Family Architecture, Programming and Design*, PHI, 2nd Edition.

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12ACS09 **JAVA PROGRAMMING**
(Common to CSE & IT)

Objectives:

The objectives of this course are as follows:

1. *To provide students an in-depth theoretical base of the Object Oriented Programming using JAVA.*
2. *To introduce the students to the programming statements of Java to manage execution flow control.*
3. *To provide knowledge about the benefits of Object Oriented Programming over Procedure oriented programming.*
4. *To familiarize and prepare students to use various concepts like Inheritance, file access techniques, Polymorphism and Memory Management techniques.*

Outcomes:

Successful completion of this course, students should be able to:

1. *Describe the principles of object-oriented programming*
2. *Apply the concepts of data encapsulation, inheritance, and polymorphism to large-scale software*
3. *Use and understand sequence of statements and blocks to control execution flow*

UNIT-I:

Introduction: Creation of Java, importance of Java to the internet, byte code, Java buzzwords, OOP Principles, Encapsulation, Inheritance and Polymorphism, data types, variables, declaring variables, dynamic initialization, scope and lifetime of variables, arrays, operators, control statements, type conversion and casting, compiling and running of a simple Java program.

UNIT-II:

Classes and Objects: Concepts of classes and objects, class fundamentals Declaring objects, assigning object reference variables, introducing methods, constructors, usage of static with data and methods, usage of final with data, access control, this key word, garbage collection, overloading methods and constructors, parameter passing, recursion, nested classes and inner classes, exploring the String class.

UNIT-III:

Inheritance: Basic concepts, member access rules, usage of the super key word, forms of inheritance, method overriding, abstract classes, dynamic method dispatch, using final with inheritance, the Object class.

UNIT-IV:

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

UNIT-V:

Exception Handling and Multithreading: Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception subclasses, Concepts of Multithreading, differences between process and thread, thread life cycle, creating multiple threads using Thread class, the Runnable interface,

Synchronization, thread priorities, inter thread communication, daemon threads, deadlocks, thread groups.

UNIT-VI:

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

AWT: Concepts of components, container, panel, window, frame, canvas, Font class, Color class and Graphics.

UNIT-VII:

AWT Controls: Buttons, Labels, Text fields, Text area, Check boxes, Check box groups, Lists, Choice, Scrollbars, Menus, Layout Managers – Flow, Border, Grid, Card and Gridbag.

Swing – JApplet, JFrame and JComponent, Icons and Labels, Handling threading issues, text fields,buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes,Trees, and Tables.

Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

UNIT-VIII:

Networking and Java Library: Basics of Networking, Inetaddress, TCP/IP sockets, Datagrams, URL,URL connection, String handling, java.util, java.io and java.net packages.

TEXT BOOKS:

1. Herbert Schildt, *The Complete Reference Java J2SE*,5th Edition, New Delhi ,TMH

Publishing Company Ltd,/PHI

2. Cay Horstmann,*Big Java*,2nd Edition, John Wiley and Sons.

REFERENCE BOOKS:

1. H.M.Dietel and P.J.Dietel,*Java How to Program*, Sixth Edition, Pearson Education.

2. Cay.S.Horstmann and Gary Cornell ,*Core Java 2Vol 1 Fundamentals* ,Seventh Edition,

Pearson Education.

3. Cay.S.Horstmann and Gary Cornell ,*Core Java 2Vol 2 Advanced Features*, Seventh

Edition, Pearson Education.

4. IverHorton ,*Beginning in Java 2*, Wrox Publications.

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12AHS11 MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Objectives:

1. This course equip the students to develop economic way of thinking in dealing with practical business problems and challenges

2. Also enable the students by providing the basic knowledge of book keeping, accounting and make analysis of financial statements of a business organization.

Outcomes:

After the completion of the course the student will be able to

1. Good knowledge of Managerial Economics
2. Know the application of financial accounting in the field of Engineering.

UNIT I

Introduction to Managerial Economics: Definition, nature and scope of managerial economics- relation with other disciplines- Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

UNIT II

Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand forecasting, factors governing demand forecasting, purposes of demand forecasting, methods of demand forecasting(Survey methods, Statistical methods, Expert opinion method, Test marketing, Controlled experiments, Judgmental approach to Demand Forecasting)

UNIT III

Theory of Production and Cost analysis: Production Function – Isoquants and Isocosts, MRTS, least cost combination of inputs, Cobb-Douglas production function, laws of returns, internal and external economies of scale.

Cost Analysis: Cost concepts, opportunity cost, fixed Vs variable costs, explicit costs Vs Implicit costs, out of pocket costs Vs Imputed costs. Break-Even Analysis (BEA) - Determination of Break Even Point (Simple Problems)- Managerial significance and limitations of BEA.

UNIT IV

Introduction to markets and Pricing Policies: Market structures: Types of competition, features of perfect competition, monopoly- monopolistic competition. Price-Output determination under perfect competition and monopoly - Methods of Pricing-cost plus pricing, marginal cost, limit pricing, skimming pricing, bundling pricing, sealed bid pricing and peak load pricing.

UNIT V

Business Organizations and New Economic Environment: Characteristic features of business, features and evaluation of sole proprietorship, partnership, Joint Stock Company, public enterprises and their types, changing business environment in post-liberalization scenario.

UNIT VI

Capital and Capital Budgeting: Capital and its significance, types of capital, estimation of fixed and working capital requirements, methods and sources of raising finance.

Nature and scope of capital budgeting, features of capital budgeting proposal, methods of capital budgeting – Payback Period, Accounting Rate of Return(ARR), Net Present value(NPV), Internal Rate of Return(IRR) and Profitability Index (PI) Methods (Simple problems).

UNIT VII

Introduction to Financial Accounting: Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

UNIT VIII

Financial Analysis through Ratios: Computation, Analysis and Interpretation of financial statements through Liquidity Ratios (Current and Quick ratio), Activity ratios (Inventory Turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debt- Equity Ratio, Interest Coverage Ratio) and Profitability ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratios and EPS).

TEXT BOOKS:

1. Aryasri, *Managerial Economics and Financial Analysis,* 4/e, TMH, 2009.
2. Varshney & Maheswari, *Managerial* Economics*,* Sultan Chand, 2009.

REFERENCES:

1. Premchand Babu, Madan Mohan, Financial Accounting and Analysis*,*Himalaya, 2009
2. Siddiqui.S.A and Siddiqui.A.S, Managerial Economics and Financial Analysis*,* New Age International,. 2009.
3. Joseph G. Nellis and David Parker, *Principles* of Business Economics*, Pearson,* 2/e, New Delhi.
4. Domnick Salvatore, Managerial Economics in a Global Economy*,* Cengage, 2009.
5. Ahuja.H.L, Managerial Economics*,* S.Chand, 3/e, 2009
6. Dr.M.A.Arulanandam & Dr.K.S.Raman, Financial Accounting*, Himalaya Publishing House.*

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12ACS10 **THEORY OF COMPUTATION**

Objectives:

The purpose of this course is to acquaint the student with an overview of the theoretical foundations of computer science from the perspective of formal languages.

1. *Classify machines by their power to recognize languages.*
2. *Employ finite state machines to solve problems in computing.*
3. *Explain deterministic and non-deterministic machines.*

Outcomes:

Successful completion of this course, students should be able to:

1. *Get good knowledge in regular languages and finite automata.*
2. *Learn context-free languages, push-down automata, and Turing recognizable languages.*
3. *Be familiar with thinking analytically and intuitively for problem solving situations in related areas of theory in computer science.*

UNIT I :

Fundamentals : Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.

UNIT II :

Finite Automata : NFA with Ɛ-transitions - Significance, acceptance of languages. Conversions and Equivalence : Equivalence between NFA with and without ε- transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Melay machines.

UNIT III :

Regular Languages : Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expression, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (proofs not required).

UNIT IV :

Grammar Formalism : Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms.Right most and leftmost derivation of strings.

UNIT V :

Context Free Grammars : Ambiguity in context free grammars. Minimization of Context Free Grammars.Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL (proofs omitted).

UNIT VI:

Push down Automata: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required). Introduction to DCFL and DPDA.

UNIT VII:

Turing Machine: Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required).

UNIT VIII

Computability Theory: Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of, problems, Universal Turing Machine, undecidability of posts. Correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

TEXT BOOKS :

1. Hopcroft H.E. and Ullman J. D "*Introduction to Automata Theory Languages and Computation"*. Pearson Education.

2. Sipser, *Introduction to Theory of Computation*, 2nd edition Thomson

REFERENCES :

1.Daniel I.A. Cohen, *Introduction to Computer Theory*, John Wiley.

2. John C Martin , *Introduction to languages and the Theory of Computation* , TMH

3. Lewis H.P. & Papadimition C.H. "*Elements of Theory of Computation",* Pearson /PHI.

4 Mishra and Chandrashekaran,*Theory of Computer Science – Automata languages and computation* - 2nd edition, PHI

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12ACS11 **JAVA PROGRAMMING LAB**
(Common to CSE & IT)

Week 1 :

a) Write a Java program that prints all real solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a,b, c and use the quadratic formula. If the discriminant $b^2 - 4ac$ is Negative, display a message stating that there are no real solutions.

b) 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 n^{th} value in the Fibonacci sequence.

Week 2 :

Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
Write a Java program to multiply two given matrices.
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)

Week 3 :

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 for sorting a given list of names in ascending order.
c) Write a Java program to do a frequency count of words in a given text.

Week 4 :

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 be for each line.

c) Write a Java program that displays the number of characters, lines and words in a text file.

Week 5 :

a) Write a Java program that:
   i. Implements stack ADT
   ii. Converts an infix expression into Postfix form
   iii. Evaluates the postfix expression

Week 6 :

a) Develop an applet that displays a simple message.

b) Develop an applet 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.

Week 7 :

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.

Week 8 :

a) Write a Java program for handling mouse events.

Week 9 :

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.

Week 10 :

Write a 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.

Week 11 :

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. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle. (Use java.net)

Week 12:

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.

Week 13 :

a) Write a Java program to create an abstract class named Shape that contains an empty method named numberOfSides ( ).Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method numberOfSides( ) that shows the number of Sides in the given geometrical figures.

b) Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a Java program to display the table using Jtable component.

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12AEC17 MICROPROCESSORS AND INTERFACING LAB

(Common to CSE & IT)

Minimum Ten Experiments to be conducted

*(Minimum **Eight** from Part A and **Two** from Part B)*

Part A

MICROPROCESSORS:

1. ALPs (8086) for addition and subtraction.
2. ALPs (8086) for multiplication and Division.
3. ALPs (8086) for sorting and searching.
4. (a) ALPs (8086) for square wave and rectangular wave generation using 8255 in I/O mode and BSR mode.

   (b) ALPs(8086) for (i) Rate Generator and (ii) Square wave generator using 8253

5. ALPs(8086) for ADC and DAC interfacing boards and drawing output Vs input characteristics.
6. ALPs (8086) for generating ramp wave, triangular wave and stair case wave forms using DAC.
7. ALP (8086) for pattern generation using dual DAC interfacing bound.
8. ALP (8086) for traffic light controller.
9. ALP (8086) for stepper motor control.

Part B

MICRO CONTROLLERS:

1. ALP (8051) to determine the largest and smallest of N bytes.
2. (a)ALP (8051) to multiply a 16-bit number by an 8-bit number.
   (b)ALP (8051) to find square root of an 8-bit number.
3. (a)ALP (8051) to determine LCM of two 8- bit numbers.

   (b)ALP (8051) to determine GCD of two 8- bit numbers.

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12ACS12 **SOFTWARE ENGINEERING**
(Common to CSE & IT)

Objectives:

1. *To teach the need of software engineering principles*
2. *To teach functional and non functional, user, system requirements.*
3. *To Explain why and when a prototype needs to be developed during software development*

Outcomes:

Successful completion of this course, students should be able to

1. *Identify the scope and necessity of software engineering*
2. *Identify the different software life cycle models.*
3. *Identify the different phases of the classical waterfall model.*

UNIT I:

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

UNIT II:

Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process.

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

UNIT III:

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 IV:

Design Engineering: Design process and Design quality, Design concepts, the design model.

Creating an architectural design: Software architecture, Data design, Architectural styles and patterns, Architectural Design.

UNIT V:

Object-oriented Design: Objects and object classes, An Object-Oriented design process, Design evolution.

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

UNIT VI:

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, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

UNIT VII:

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.

UNIT VIII:

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,* 6thEdition.McGrawHill International Edition.
2. Sommerville, *Software Engineering*, 7th edition, Pearson education.

REFERENCES :

1. K.K. Agarwal & Yogesh Singh , *Software Engineering*, New Age International Publishers

2. James F. Peters , *Software Engineering, an Engineering approach*, WitoldPedrycz, John Wiley.

3. Shely Cashman Rosenblatt, *Systems Analysis and Design,* Thomson Publications.

4. Waman S Jawadekar, *Software Engineering principles and practice*, The McGraw-Hill Companies.

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12AHS12 MANAGEMENT SCIENCE

Objectives:

1. To provide an overview of management and its various principles to Engineering students to face the challenges of technology driven Industry.
2. To provide basic knowledge of recent HR and marketing practices and make them to understand other contemporary management concepts.

Outcomes: *After completion of this course students will be able*

1. To apply Management functions & principles in the field of Engineering.
2. To use the management techniques and managerial skills which are necessary for engineering practice.

UNIT I

Introduction to Management: Concepts of Management and organization- nature, importance and Functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management, Mayo's Hawthorne Experiments, Maslow's Theory of Human Needs, Douglas McGregor's Theory X and Theory Y, Herzberg's Two-Factor Theory of Motivation, Systems Approach to Management, Leadership Styles, Social responsibilities of Management.

UNIT II

Designing Organizational Structures: Basic concepts related to Organization - Departmentation and Decentralization, Types of mechanistic and organic structures of organization (Line organization, Line and staff organization, functional organization, Committee organization, matrix organization, Virtual Organization, Cellular Organization, team structure, boundary less organization, inverted pyramid structure, lean and flat organization structure) and their merits, demerits and suitability.

UNIT III

Operations Management : Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement- Statistical Quality Control: chart, R chart, *c* chart, *p* chart, (simple Problems), Acceptance Sampling, Deming's contribution to quality.

UNIT IV

Materials Management: Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records.
Marketing: Functions of Marketing, Marketing Mix, and Marketing Strategies based on Product Life Cycle, Channels of distribution.

UNIT V

Human Resources Management (HRM) : Concepts of HRM, HRD and Personnel Management and Industrial Relations (PMIR), HRM vs PMIR, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Wage and Salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating.

UNIT VI

Project Management (PERT/CPM) : Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing. (simple problems)

UNIT VII

Strategic Management : Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives.

UNIT VIII

Contemporary Management Practices: Basic concepts of MIS, End User Computing, Materials Requirement Planning (MRP), Just-In-Time (JIT) System, Total Quality Management (TQM), Six sigma and Capability Maturity Model (CMM) Levels, Supply Chain Management, Enterprise Resource Planning (ERP), Performance Management, Business Process outsourcing (BPO), Business Process Re-engineering and Bench Marking, Balanced Score Card.

TEXT BOOKS:

1. Aryasri: *Management Science*, TMH, 2004.
2. Stoner, Freeman, Gilbert, *Management*, 6th Ed, Pearson Education, New Delhi, 2004.

REFERENCES:

1. Kotler Philip & Keller Kevin Lane, *Marketing Mangement* 12/e, PHI, 2005.
2. Koontz & Weihrich, *Essentials of Management*, 6/e, TMH, 2005.
3. Thomas N.Duening & John M.Ivancevich, *Management—Principles and Guidelines*, Biztantra, 2003.
4. Kanishka Bedi, *Production and Operations Management*, Oxford University Press, 2004.
5. Memoria & S.V.Gauker, *Personnel Management*, Himalaya, 25/e, 2005
6. Samuel C.Certo, *Modern Management*, 9/e, PHI, 2005
7. Schermerhorn, Capling, Poole & Wiesner, *Management*, Wiley, 2002.
8. Parnell, *Strategic Management*, Biztantra, 2003.
9. Lawrence R Jauch, R.Gupta &William F.Glueck, *Business Policy and Strategic Management*, Frank Bros., 2005.
10. L.S.Srinath, *PERT/CPM*,Affiliated East-West Press, 2005.

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12ACS13 COMPILER DESIGN

Objectives:

1. *Describe the steps and algorithms used by language translators.*
2. *Push-down automata and their connection to language definition through regular expressions and grammars.*
3. *Discuss the effectiveness of the optimization.*

Outcomes:

At the end of the course student should be able to:

1. *Understand how the design of a compiler requires most of the knowledge acquired during their study.*
2. *Working skills in theory and application of finite state machines, recursive descent, production rules, parsing, and language semantics.*
3. *Develop a large, complex, but well-structured software system that implements various phases of a compiler such as the scanner, parser, code generator, and optimizer.*

UNIT I

Overview of the Compilation: Phases of Compilation – Lexical Analysis, Regular Grammar and regular expression for common programming language features, pass and Phases of translation, interpretation, bootstrapping, data structures in compilation – LEX lexical analyzer generator.

UNIT II

Top Down Parsing : Context free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing.

UNIT III

Bottom Up Parsing : Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing , handling ambiguous grammar, YACC – automatic parser generator.

UNIT IV

Semantic Analysis : Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes. Attributed grammars, Syntax directed translation, Conversion of popular Programming languages language Constructs into Intermediate code forms, Type checker.

UNIT V

Symbol Tables : Symbol table format, organization for block structures languages, hashing, tree structure representation of scope information. Block structures and non block structure storage allocation: static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

UNIT VI

Code Optimization : Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.

UNIT VII

Data Flow Analysis : Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

UNIT VIII

Object Code Generation : Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

T**EXT BOOKS :**

1. A.V. Aho .J.D.Ullman, *Principles of compiler design*, Pearson Education.

2. Andrew N. Appel, *Modern Compiler Implementation in C*, Cambridge University Press.

REFERENCES :

1. John R. Levine, Tony Mason, Doug Brown ,*LEX&YACC*, O'reilly.

2. Dick Grune, Henry E. Bal, Cariel T. H. Jacobs , *Modern Compiler Design*, Wiley dreamtech.

3.Cooper& Linda,*Engineering a Compiler*, Elsevier.

4. Louden ,*Compiler Construction*, Thomson.

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12ACS14 **COMPUTER GRAPHICS**
(Common to CSE & IT)

Objectives:

1. *In this course, students will be introduced to the basic principles and problems of computer graphics.*
2. *This course covers fundamental principles and algorithms underlying computer graphics, including line drawing algorithms, circle/ellipse drawing algorithms, 2D, 3D geometric transformations, viewing in 3D.*
3. *Students will learn how to use a standard graphics API (Application Programming Interface) to create, render, and manipulate interactively structured two- and three-dimensional models.*

Outcomes:

At the end of the course student should be able to:

1. *Know how visual information is modeled and represented digitally.*
2. *Understand how visual information is computed and manipulated in 2D and 3D.*
3. *Be able to use and develop computer graphics APIs in both 2D and 3D.*

UNIT I:

Introduction: Application of Computer Graphics, raster scan systems, random scan systems, Raster scan display processors.

Output Primitives: Points and lines, line drawing algorithms(Bresenham's and DDA Line Derivations and algorithms), midpoint circle and ellipse algorithms.

UNIT II:

Filled Area Primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms, Inside and outside tests.

UNIT III:

2D Geometrical Transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transform, transformations between coordinate systems. (p.nos 204-227 of text book-1).

UNIT IV :

2D 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 V :

3-D object Representation : Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces.

UNIT VI :

3D Geometric Transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations. 3D Viewing pipeline, clipping, projections(Parallel and Perspective).

UNIT VII :

Visible Surface Detection Methods: Classification, back-face detection, depth buffer,scan-line, depth sorting, BSPtree methods, area sub-division and octree methods.

UNIT VIII :

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, M.Pauline Baker , *Computer Graphics C version*, Pearson
2. Rajesh K Maurya, *Computer Graphics with Virtual Reality Systems*, Wiley
3. Frank Klawonn, *Introduction to Computer Graphics, Using Java 2D and 3D*, Springer
4. Steven Harrington ,*Computer Graphics*, TMH
5. Amarendra N Sinha, ArunUdai,*Computer Graphics*, TMH

REFERENCE BOOKS:

1. Foley, VanDam, Feiner, Hughes ,*Computer Graphics Principles & practice*, 2/e, Pearson.
2. Peter, Shirley ,*Computer Graphics*, CENGAGE
3. Neuman ,Sproul,*Principles of Interactive Computer Graphics*, TMH.
4. David, Soloman,*The Computer Graphics manual, Vol 2*, Springer
5. David F Rogers ,*Procedural elements for Computer Graphics*, 2/e, TMH

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12ACS15 **COMPUTER NETWORKS**
(Common to CSE & IT)

Objectives:

1. *Understanding the way networks work. Basic probability applied to networks*
2. *Understanding the Internet protocol (IP) and the transmission control protocol (TCP).*
3. *The analyses of LAN: Ethernet. To provide basic understanding of Internet networking layers. To provide an overview of the Application layer.*

Outcomes:

1. *Students understand elementary components of networks and the way networks work.*
2. *Students understand the architecture and characteristics of LANs. Understand the basic functionality of each of the Internet Networking layers.*

UNIT 1

Introduction: Network Hardware, Network Software, References Models. Examples of Networks: Novell Networks, ARPANET, Network Topologies, LAN, MAN, WAN

The Physical Layer: The Theoretical Basis for Data Communication Guided Transmission Media, Communication Satellites, The Public Switched Telephone Network- The Local Loop: Modern ADSL, and wireless, Trunks and Multiplexing, Switching

UNIT II

The Data Link Layer: Data link Layer Design Issues, Elementry Data Link Protocols, Sliding Window Protocols,Example Data Link Protocols.

UNIT III

The Medium Access Control Sublayer: The Channel allocation Problem, Multiple Access protocols, Ethernet- Ethernet Cabling, Manchester Encoding, The Ethernet MAC Sublayer Protocol. The Binary Exponential Backoff Algorithm, Ethernet Performance, Switched Ethernet, Fast Ethernet. Wireless LANs- The 802.11 Protocol Stack, The 802.11 Physical Layer, The 802.11 MAC SubLayer Protocol, The 802.11 Frame Structure,Data Link layer Switching.

UNIT IV

The Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms.

UNIT V

Internetworking, The Network Layer in the Internet.

UNIT VI

The Transport Layer: The Transport Service, Elements of Transport Protocols, The Internet Transport Protocols: UDP, The Internet Transport Protocols: TCP.

UNTI VII

The Application Layer: DNS-The Domain Name System, Electronic Mail. The World Wide web, Multimedia.

UNTI VIII

Network Security: Cryptography, Symmetric-Key Algorithms, Public-Key Algorithms, Digital Signatures.

TEXT BOOKS:

1. Andrew S. Tanenbaum,*Computer Networks*, Fourth Edition, Pearson Education.

REFERENCES:

1. Michael A. Gallo, William M. Hancock ,*Computer Communications and Networking Technologies*, Cengage Learning.
2. Natalia Olifer, Victor Olifer, *Computer Networks: Principles, Technologies and Protocols for Network Design,* Wiley India.
3. Behrouz A. Forouzan,*Data Communications and Networking*, Fourth Edition, Tata McGraw Hill.
4. W.A.Shay,*Understanding Communications and Networks*, Third Edition, Cengage Learning.
5. James F.Kurose, K.W.Ross,*Computer Networking: A Top-Down Approach Featuring the Internet,* Third Edition, Pearson Education.

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12ACS16 **OPERATING SYSTEMS**
(Common to CSE & IT)

Objectives:

1. *To develop an understanding of basic operating system concepts.*
2. *To gain an understanding of how an operating system manages concurrency.*
3. *To develop a knowledge of modern operating system practice*

Outcomes:

1. *Students will understand basic operating system concepts: Computer and Operating System Structures, Process Management, Storage Management, Protection.*
2. *Students will understand the fundamental elements of thread and process concurrency.*
3. *Students will be able to relate modern industrial-strength operating system design and implementation to general operating system concepts :Windows 7,UNIX*

UNIT I

Operating Systems Overview: Operating system functions, Overview of computer operating systems, protection and security, distributed systems, special purpose systems, operating systems structures: operating system services and system calls, system programs, operating system structure, operating systems generation.

UNIT II

Process Management: Process concepts, threads, scheduling-criteria, algorithms, their evaluation, Thread scheduling, case studies UNIX, Linux, Windows.

UNIT III

Concurrency: Process synchronization, the critical-section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions. Case studies UNIX, Linux, Windows.

UNIT IV

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement, algorithms, Allocation of frames, Thrashing case studies UNIX, Linux, Windows

UNIT V

Principles of Deadlock: system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock.

UNIT VI

File system Interface: The concept of a file, Access Methods, Directory structure, File system mounting, File sharing, protection. File System implementation**:** File system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, case studies. UNIX, Linux, Windows.

UNIT VII

Mass-Storage Structure: overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management, RAID structure, stable-storage implementation,

Tertiary storage structure. I/O systems: Hardware, application I/o interface, kernel I/O subsystem, Transforming I/O requests to Hardware operations, STREAMS, performance.

UNIT VIII

Protection: Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language – Based Protection, Security:The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer –security classifications, case studies UNIX, Linux, Windows.

TEXT BOOKS:

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne ,*Operating System Concepts*, Eighth edition, John Wiley.
2. D.M.Dhamdhere, *Operating Systems, A Concept based Approach*, Second Edition, TMH.

REFERENCES:

1. Stallings , *Operating Systems: Internals and Design Principles*, Sixth Edition–2009, Pearson Education.
2. Andrew S Tanenbaum, *Modern Operating Systems*, Second Edition, PHI.
3. S.Haldar, A.A.Aravind, *Operating Systems*, Pearson Education.
4. B.L.Stuart, *Principles of Operating Systems*, Cengage learning, India Edition.
5. A.S.Godbole *Operating Systems*, Second Edition, TMH.

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12ACS17 **Compiler Design & Computer Graphics Lab**
(Common to CSE & IT)

Part-A

1. Design a Lexical Analyzer for the given language. The lexical Analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value.
2. Implement the lexical Analyzer using JLex, flex or Lex or other lexical analyser generating tools.
3. Design Predictive parser for the given language
4. Design LALR bottom up parser for the given language.
5. Convert the BNF rules into Yacc form and write code to generate an abstract syntax tree.

Part-B

1. Write a Program to draw a line using a midpoint Bresenham algorithm.
2. Write a Program to draw a line using the DDA algorithm.
3. Write a Program to draw a Circle using the Bresenham algorithm.
4. Write a Program to draw a Ellipse using a midpoint ellipse algorithm.
5. Implement 2D transformations.
6. Implement Cohen-Sutherland 2D clipping and window-view port mapping.
7. Implement translation, scaling using 3D transformations.
8. Write a program to draw a hut using simple graphics functions.
9. Write a program to fill a polygon.

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12ACS18 **Computer Networks & Operating Systems Lab**
(Common to CSE & IT)

Part-A

1. Implementation of the Data Link Layer Framing methods Character Stuffing and Bit stuffing.
2. Implementation of CRC polynomials - CRC 12, CRC 16 and CRC CCIP.
3. Implementation of Sliding Window Protocol Select Repeat ARQ.
4. Implementation of Sliding Window Protocols Go Back N ARQ .
5. Implementation of Dijkstra's algorithm for Shortest Path.
6. Implementation Link State Routing algorithm.
7. Program to obtain Routing table for each node using the Distance Vector Routing algorithm of a given subnet.
8. Implementation of encryption & decryption using DES algorithm.
9. Implementation of encryption & decryption mechanisms using RSA algorithm.

Part-B

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. Simulate Bankers Algorithm for Dead Lock Prevention
7. Simulate all page replacement algorithms
   a. FIFO b. LRU c. LFU
8. Simulate Paging Technique of memory management

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12ACS19 OBJECT ORIENTED ANALYSIS AND DESIGN
(Common to CSE & IT)

Objectives:

1. *Discuss why we make models*
2. *Create class diagrams that model both the domain model and the design model of a software system.*
3. *Create interaction diagrams that model the dynamic aspects of a software system.*

Outcomes:

At the end of the course student should be able to:

1. *Learn fundamental process pattern for object-oriented analysis and design*
2. *Learn how to derive an analysis model from use case requirements*
3. *Learn how to model event-driven state of objects*

UNIT I

Introduction to UML: Importance of modelling, principles of modelling, object oriented modelling, conceptual model of the UML, Architecture, Software Development Life Cycle.

UNIT II

Basic Structural Modelling: Classes, Relationships, Common Mechanisms, and diagrams.

Advanced Structural Modelling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

UNIT III

Class & Object Diagrams: Terms, concepts, modelling techniques for Class & Object Diagrams.

UNIT IV

Basic Behavioural Modelling-I: Interactions, Interaction diagrams.

UNIT V

Basic Behavioural Modelling-II: Use cases, Use case Diagrams, Activity Diagrams.

UNIT VI

Advanced Behavioural Modelling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT VII

Architectural modelling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT VIII

Case Study: The Unified Library application.

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, IvarJacobson, *The Unified Modeling Language User*, Guide Pearson Education.
2. Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, *UML 2 Toolkit*, Hans, WILEY-Dreamtech India Pvt. Ltd.

REFERENCES:

1. Meilir Page-Jones , *Fundamentals of Object Oriented Design in UML*, Pearson Education.
2. Pascal Roques, *Modeling Software Systems Using UML2,* WILEY- Dreamtech India Pvt. Ltd.
3. Atul Kahate, *Object Oriented Analysis and Design*, The McGraw-Hill Companies.
4. John W. Satzinger, Robert B Jackson and Stephen D Burd, *Object-oriented Analysis and Design with the Unified Process,* Cengage Learning.
5. Russ Miles and Kim Hamilton, Learning *UML 2.0*,O'Reilly, SPD.

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12ACS20 PRINCIPLES OF PROGRAMMING LANGUAGES

Objectives:

1. *Introducing the fundamental principles of language design.*
2. *Introducing formal syntax and semantics.*
3. *Discussing control structures and abstractions.*

Outcomes

At the end of this course, students will be able to:

1. *Apply principles of language design towards requirements.*
2. *Understand and appreciate the different paradigms of programming languages.*
3. *Write the formal syntax of a specification*.

UNIT I

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms: Imperative, Object Oriented, functional Programming, Logic Programming. Programming Language Implementation, Compilation and Virtual Machines, Programming environments.

UNIT II

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax, BNF, EBNF for common programming language features, parse trees, ambiguous grammars, attribute grammars, Denotational semantics and axiomatic semantics for common programming language features.

UNIT III

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

UNIT IV

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures: Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

UNIT V

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines.

UNIT VI

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small

talk, C++, Java, C#, Ada 95, Concurrency: Subprogram level concurrency, semaphores, monitors, message passing, Java threads, C# threads.

UNIT VII

Exception handling: Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

Logic Programming Language : Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

UNIT VIII

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

Scripting Language: Pragmatics, Key Concepts, Case Study : Python – Values and Types, Variables , Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction, Separate Compilation, Module Library.

TEXT BOOKS:

1. Robert W. Sebesta, *Concepts of Programming Languages*, Eighth Edition, Pearson Education, 2008.
2. D. A. Watt, *Programming Language Design Concepts*, Wiley Dreamtech, rp-2007.

REFERENCES:

1. A.B. Tucker, R.E. Noonan , *Programming Languages*, Second Edition,TMH.
2. K. C.Louden,*Programming Languages*, Second Edition, Thomson, 2003.
3. Patric Henry Winston and Paul Horn ,*LISP*, Pearson Education.
4. W.F. Clocksin and C.S.Mellish,*Programming in Prolog*, Fifth Edition, Springer.
5. M.Lutz,*Programming Python*, Third Edition, O'reilly, SPD, rp-2007.

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12ACS21 DESIGN AND ANALYSIS OF ALGORITHMS

Objectives:

1. *To expose students to a variety of techniques for designing and analyzing algorithms*
2. *It also ensures that students understand how the worst-case time complexity of an algorithm is defined,*
3. *Formulate the time order analysis for an algorithm. to Prove the correctness of an algorithm.*

Outcomes

1. *Describe, apply and analyze the complexity of certain divide and conquer, greedy, and dynamic programming algorithms.*
2. *Describe the classes P, NP, and NP-Complete and be able to prove that a certain problem is NP-Complete.*
3. *They will gain the ability to analyze worst-case running time of algorithms and understand fundamental algorithmic problems.*

UNIT I :

Introduction: Algorithm, Psuedo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis.

UNIT II:

Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and biconnected components.

UNIT III:

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

UNIT IV:

Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT V:

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

UNIT VI:

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

UNIT VII:

Branch and Bound: General method, applications - Travelling salesperson problem,0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT VIII:

NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Cook's theorem.

TEXT BOOKS:

1.Ellis Horowitz,SatrajSahni and Rajasekharam*, Fundamentals of Computer Algorithms,* Galgotia publications Pvt.Ltd.

2.M.T.Goodrich and R.Tomassia,*Algorithm Design: Foundations, Analysis and Internet examples*,John Wiley and sons.

REFERENCES :

1. T.H.Cormen,C.E.LeisersonR.L.Rivest,andC.Stein,Introduction to Algorithms, second edition,PHI Pvt. Ltd./ Pearson Education

2.R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai ,*Introduction to Design and Analysis of Algorithms A strategic approach*, McGraw Hill.

3.Allen Weiss,*Data structures and Algorithm Analysis in C++,* Second Edition, Pearson education.

4.Aho, Ullman and Hopcroft,*Design and Analysis of algorithms*, ,Pearson Education.

5. Richard Johnson baugh and Marcus Schaefer,*Algorithms* , Pearson Education

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12ACS22 **INFORMATION SECURITY**
(Common to CSE & IT)

Objectives:

1. *Understand information security's importance in our increasingly computer-driven world.*
2. *To Disscuss various security attacks and security service.*
3. *To Teach various security policies (such as authentication, integrity and confidentiality), as well as protocols to implement such policies in the form of message exchanges.*

Outcomes

At the end of this course, students will be able to:

1. *Understand convententional Encryption Principles and algororithms.*
2. *Understand the pubic key cryptography principles, cryptograph algorithms.*
3. *Understand the importance of Intrusion Detection Systems*

UNIT - I

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

UNIT - II

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

UNIT - III

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

UNIT - IV

Email privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT - V

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

UNIT - VI

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT - VII

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3.Intruders, Viruses and related threats.

UNIT - VIII

Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

TEXT BOOKS :

1.William Stallings,*Network Security Essentials (Applications and Standards),* Pearson Education.

2. Ryan Russell, Dan Kaminsky, Rain ForestPuppy, Joe Grand, David Ahmad, Hal Flynn IdoDubrawsky, SteveW.Manzuik and Ryan Permeh, *Hack Proofing your network* , WileyDreamtech

REFERENCES :

1. Eric Maiwald,Fundamentals of Network Security, (Dreamtech press)

2. CharlieKaufman, RadiaPerlman and Mike,*Network Security - Private Communication in a Public World* ,Speciner, Pearson/PHI.

3. Stallings ,*Cryptography and network Security,* Third edition, , PHI/Pearson

4. Whitman,*Principles of Information Security*, Thomson.

5. Robert Bragg, Mark Rhodes ,*Network Security: The complete reference*,TMH

6. Buchmann,*Introduction to Cryptography*, Springer.

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12ACS23 INTERNET & WEB TECHNOLOGY

Objectives:

1. *Describe client-side scripting technologies and compare JavaScript and VBScript.*
2. *Describe server-side programming technologies and compare CGI/Perl, PHP, Active Server Pages, and Java Server Pages.*
3. *Compare the structure and function of markup languages including HTML, XHTML, DHTML, SGML, and XML.*

Outcomes

At the end of this course, students will be able to:

1. Use common HTML tags, attributes and parameters for common page elements, including document sections, text formatting, lists, images, image maps and links.
2. Create formatted tables using HTML to organize content and page layout.
3. Create HTML forms using push buttons, radio buttons, check boxes, pull-down and multiple-select menus, text boxes, and text areas.
4. Use internal and external cascading style sheets (CSS) to consistently format elements on a page or group of pages.

UNIT - I

Fundamentals of Web, XHTML – 1: A brief introduction to the Internet, the World Wide Web, Web Browsers, Web Servers, Uniform Resource Locators, Multipurpose Internet Mail Extensions, The Hyper Text Transfer Protocol, Security, The Web Programmers Toolbox.

Introduction to XHTML-2: Origins and evolution of HTML and XHTML, Basic syntax, Standard XHTML document structure, Basic text markup, Images, Hypertext Links, Lists, Tables, Forms, Frames, Syntactic differences between HTML and XHTML.

UNIT - II

Cascading Style Sheets : Introduction, Levels of style sheets, Style specification formats, Selector forms, Property value forms, Font properties, List properties, Color, Alignment of text, The Box model, Background images, The< span > and< div > tags, Conflict resolution.

UNIT - III

JAVASCRIPT: Overview of JavaScript, Object orientation and JavaScript, General syntactic characteristics, Primitives, operations, and expressions, Screen output and keyboard input, Control statements, Object creation and modification, Arrays, Functions, Constructor, Pattern matching using regular expressions, Errors in scripts, Examples.

UNIT - IV

JAVASCRIPT AND HTML DOCUMENTS: The JavaScript execution environment, The Document Object Model, Element access in JavaScript, Events and Event handling, Handling events from the Body elements, Handling events from the Button elements, Handling events from the Text box and Password elements, The DOM 2 event model, The navigator object, DOM tree traversal and modification.

UNIT - V

DYNAMIC DOCUMENTS WITH JAVASCRIPT: Introduction to dynamic documents, Positioning elements, Moving elements, Element visibility, Changing colors and fonts, Dynamic content, Stacking elements, Locating the mouse cursor, Reacting to a mouse click, Slow movement of elements, Dragging and dropping elements.

UNIT - VI

XML: Introduction to XML, The Syntax of XML, XML Document structure, Document Type definitions, Namespaces, XML schemas, Displaying raw XML documents, Displaying XML documents with CSS, XSLT style sheets, XML processors, Web services.

UNIT – VII

PERL, CGI PROGRAMMING: Origins and uses of Perl, Scalars and their operations, Assignment statements and simple input and output, Control statements, Fundamentals of arrays, Hashes, References, Functions, Pattern matching, File input and output, Examples. The Common Gateway Interface, CGI linkage, Query string format, CGI.pm module, A survey example, Cookies.

UNIT – VIII

Introduction to PHP : Origins and uses of PHP, Overview of PHP, General syntactic characteristics, Primitives, operations, and expressions, output, Control statements, Arrays, Functions, Pattern matching, Form handling ,files, Cookies, Session tracking Database Access through the web

TEXT BOOK:

1. Robert W. Sebesta*, Programming the World Wide Web*, 4th Edition, Pearson Education,

2008.

REFERENCE BOOKS:

1.M. Deitel, P.J. Deitel, A. B. Goldberg ,*Internet*& *World Wide Web How to H program*,

3rd Edition, Pearson Education / PHI, 2004.

2.Chris Bates ,*Web Programming Building Internet Applications* , 3rd Edition, Wiley India,

2006.

3.XueBai et al ,*The Web Warrior Guide to Web Programming* , Thoms

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12ACS24 **DATABASE MANAGEMENT SYSTEMS**
(Common to CSE & IT)

Objectives:

1. *To define a Database Management System, identify the major types of relational management systems*
2. *Compare relational model with the Structured Query Language(SQL)*
3. *Effectively retrieve data from relational databases using standard query languages*

Outcomes

At the end of this course, students will be able to:

1. *Create an ER diagram as a conceptual database design by analyzing database requirements*
2. *Formulate a correct SQL expression to answer an analyzed query that involves select-project-join, negation, union, intersection, aggregation (min,max, sum, count, avg),etc..*
3. *Correctly use the techniques, components and tools of a typical database management system -- such as Oracle 8i -- to build a comprehensive database information system (an application);*

UNIT I

Introduction: Database System Applications, data base System VS file System, View of Data, Data Abstraction, instances and Schemas, data Models, the ER Model, Relational Model ,Other Models,

Database Languages : DDL, DML, database Access for applications Programs ,data base Users and Administrator ,Transaction Management ,data base System Structure , Storage Manager, the Query Processor

UNIT II

History of Database Systems: Database design and ER diagrams, Beyond ER Design Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Concept Design with the ER Model ,Conceptual Design for Large enterprises.

UNIT III

Introduction to the 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: Selection and projection set operations , renaming, Joins , Division, Examples of Algebra overviews

Relational calculus: Tuple relational Calculus

UNIT IV

Form of Basic SQL Query: Examples of Basic SQL Queries, Introduction to Nested Queries ,Correlated Nested Queries Set ,Comparison Operators, Aggregative Operators, NULL values , Comparison using Null values, Logical connectivity's, AND, OR and NOT, Impact on SQL Constructs , Outer Joins, Disallowing NULL values, Complex Integrity Constraints in SQL Triggers and Active Databases.

UNIT V

Schema Refinement: Problems Caused by redundancy, Decompositions , Problem related to decomposition , reasoning about FDS, FIRST, SECOND, THIRD Normal forms, BCNF ,Lossless

join decomposition ,Dependency preserving Decomposition, Schema refinement in Database Design, Multivalued Dependencies, FOURTH Normal Form.

UNIT VI

Transaction Concept: Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability ,Implementation of Isolation, Testing for serializability, Failure classification, Storage, Recovery and Atomicity, Recovery algorithm.

UNIT VII

Storage and Indexing : Data in External Storage , File Organization and Indexing, Cluster Indexes, Primary and Secondary Indexes , Index data Structures , Hash Based Indexing :Tree base Indexing ,Comparison of File Organizations ,Indexes and Performance Tuning.

UNIT VIII

Tree Structured Indexing : Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM)

B+ Trees: A Dynamic Index Structure.

TEXT BOOKS:

1. Raghurama Krishnan, Johannes Gehrke, *Database Management Systems*, 3/e, , TMH

2. Silberschatz, Korth,*Database System Concepts*,5/e, TMH

REFERENCE BOOKS:

1.Elmasri Navathe, *Database Management System*, 5/e,PEA

2. C.J.Date, *Introduction to Database Systems*, 8/e, PEA

3. Peter ROB,Coronel,*Database System Concepts* , Ceneage.

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12ACS25 **WEB TECHNOLOGIES LAB**

1.Develop and demonstrate a XHTML document that illustrates the use external style sheet,ordered list, table, borders, padding, color, and the tag.

2. Develop and demonstrate a XHTML file that includes JavaScript scripts for the following problems:

a) Input: A number n obtained using prompt

Output: The first n Fibonacci numbers

b) Input: A number n obtained using prompt

Output: A table of numbers from 1 to n and their squares using alert

3.Develop and demonstrate a XHTML file that includes a JavaScript script that uses functions for the following problems:

a) Parameter: A string

Output: The position in the string of the left-most vowel

b) Parameter: A number

Output: The number with its digits in the reverse order

4. a) Develop and demonstrate, using JavaScript script, a XHTML document that collects the USN (the valid format is: A digit from 1 to 4 followed by two uppercase characters followed by two digits followed by two uppercase characters followed by three digits; no embedded spaces allowed) of the user. The event handler must be included for the form element that collects this information to validate the input. Messages in the alert windows must be produced when errors are detected.

b) Modify the above program to get the current semester also (restricted to be a number from 1 to 8)

5. a) Develop and demonstrate, using JavaScript script, a XHTML document that contains three short paragraphs of text, stacked on top of each other, with only enough of each showing so that the mouse cursor can be placed over some part of them. When the cursor is placed over the exposed part of any paragraph, it should rise to the top to become completely visible.

b) Modify the above document so that when a paragraph has moved from the top stacking position,it returns to its original position rather than to the bottom.

6. a) Design an XML document to store information about students of SVCET. The information must include Roll No, Name, and Name of the College, Brach, Year of Joining, and e-mail id. Make up sample data for 3 students. Create a CSS style sheet and use it to display the document.

b) Create an XSLT style sheet for one student element of the above document and use it to create a display of that element.

7. a) Write a Perl program to display the various Server Information like Server Name, Server Software, Server protocol, CGI Revision etc.

b) Write a Perl program to accept UNIX commands from a HTML form and to display the output of the command executed.

8. a) Write a Perl program to accept the User Name and display a greeting message randomly chosen from a list of 4 greeting messages.

b) Write a Perl program to keep track of the number of visitors visiting the web page and to display this count of visitors, with proper headings.

9. Write a Perl program to display a digital clock which displays the current time of the server.

10. Write a Perl program to insert name and age information entered by the user into a table created using MySQL and to display the current contents of this table.

11.Write a PHP program to store current date-time in a COOKIE and display the 'Last visited on' date-time on the web page upon reopening of the same page.

12.Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on the web page.

13.Create XHTML form with Name, Address Line 1, Address Line 2, and E-mail text fields. On submitting, store the values in MySQL table. Retrieve and display the data based on the name.

14.Using PHP and MySQL, develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.

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12ACS26 **Database Management Systems LAB**
(Common to CSE & IT)

1) Creating, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using the SELECT command.

2) Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.

   Example:- Select the roll number and the name of the student who secured the fourth rank in the class.

3) Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

4) Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)

5) i)Creation of simple PL/SQL program which includes a declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)

   ii)Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

6) Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.

7) Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE- APPLICATION ERROR.

8) Program development using a creation of procedures, passing parameters IN and OUT of PROCEDURES.

9) Program development using the creation of stored functions, invoke functions in SQL Statements and write complex functions.

10) Program development using a creation of the package specification, package bodies, private objects, package variables and cursors and calling stored packages.

11) Develop programs using feature parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of the clause and CURSOR variables.

12) Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

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12ACS28 **E- COMMERCE**

Objectives:

1. *To describe and discuss the contents and framework of E-Commerce*
2. *To describe the digital revolution as a drive of E-Commerce.*
3. *To describe the bussiness environment as a drive of E-Commerce*

Outcomes:

At the end of the course, students should be able to:

1. *Understand the Electronic Commerce framework, Consumer oriented Electronic commerce.*
2. *Analyze the impact of E-commerce on business models and strategy*
3. *Describe Internet trading relationships including Business to Consumer, Business-to-Business, Intra-organizational.*

UNIT I

Electronic Commerce-Framework, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.

UNIT II

Consumer Oriented Electronic commerce - Mercantile Process models

UNIT III

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

UNIT IV

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

UNIT V

Intra Organizational Commerce – workFlow, Automation Customization and internal Commerce, Supply chain Management.

UNIT VI

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 VII

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

UNIT VIII

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

TEXT BOOKS:

1.Kalakata, Whinston,*Frontiers of electronic commerce* , Pearson.

REFERENCE BOOKS:

1.Hendry Chan, Raymond Lee,Tharam Dillon, Ellizabeth Chang,*E-Commerce fundamentals and applications,* John Wiley.

2.S.Jaiswal*, E-Commerce,*Galgotia.

3.Efrain Turbon, Jae Lee, David King, H.Michael Chang,*E-Commerce.*

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12ACS29 SOFTWARE TESTING

Objectives:

1. *Software testing is the process of finding bugs or errors in the software*
2. *Introducing the various testing methods.*
3. *Testing starts with known conditions, uses predefined procedures and has predictable outcomes.*
4. *To Understand the essential characteristics of tools used for test automation*

Outcomes:

At the end of the course, students should be able to:

1. *Understand the importance of testing and debugging.*
2. *Interpret a model for testing and understand the process of testing, Discuss the limitations of testing.*
3. *Classify the bugs into different categories.*

UNIT I

Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs. Criteria for the Success of Software Project, Process oriented Software development.

UNIT II

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 III

Transaction Flow Testing: transaction flows, transaction flow testing techniques. Data flow testing: Basics of data flow testing, strategies in data flow testing,

UNIT IV

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

UNIT V

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

UNIT VI

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

UNIT VII

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

UNIT VIII

Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. (The student should be given an exposure to a tool like JMeter or Win-runner).

TEXT BOOKS:

1. Boris Beizer, *Software Testing techniques,*Second Edition,Dreamtech.
2. Dr.K.V.K.K.Prasad,*Software Testing Tools*, Dreamtech.

REFERENCES:

1. Brian Marick,*The craft of software testing,* Pearson Education.
2. P.C.Jorgensen,*Software Testing,* Third Edition, Aurbach Publications (Dist.byPD).
3. N.Chauhan,*Software Testing,* Oxford University Press.
4. P.Ammann and J.Offutt, *Introduction to Software Testing,* Cambridge Univ.Press.
5. Perry, John Wiley ,*Effective methods of Software Testing*, Second Edition, 1999.
6. P.NageswaraRao,*Software Testing Concepts and Tools* , Dreamtech Press.

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12ACS30 **Data Mining and Business Analytics**
(Common to CSE & IT)

Objectives:

1. Compare and contrast different conceptions of data mining as evidenced in both research and application.
2. Explain the role of finding associations in library data , commercial market basket data.
3. Characterize the kinds of patterns that can be discovered by association rule mining.
4. Identify and characterize sources of noise, redundancy, and outliers in presenting data.

Outcomes:

At the end of this course the student should be able to

1. Describe how to extend a relational system to find patterns using association rules.
2. Evaluate methodological issues underlying the effective application of data mining.
3. understand the technology and processes associated with Business Intelligence framework

UNIT 1

Introduction to Data Mining : What is Data Mining? ,Data Mining Functionalities, Classification of Data Mining systems, Integration of Data Mining system with a Database or a Data Warehouse System, Major issues in Data Mining,

UNIT II

Data Preprocessing: why Preprocess the Data? Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

Data Warehouse and OLAP Technology for Data Mining: What is Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture,

UNIT III

Mining Frequent Patterns, Associations&Correlation : Basic Concepts and a Road Map, Efficient and Scalable Frequent Itemset Mining methods, mining various kinds of association rules, From association mining to Correlation analysis, constraint-based association mining.

UNIT IV

Classification and Prediction : What is classification? What is Prediction? Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification,Classification by Backpropagation.

Prediction: Linear regression, nonlinear regression, Accuracy and Error measures, evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods

UNIT V

Cluster Analysis : What is cluster analysis ?Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Model-Based Clustering Methods.

UNIT VI

Mining Streams, Time Series and Sequence Data: Mining Data Streams, Mining Time-Series Data, Mining Sequence Patterns in Transactional Databases, Mining Sequence Patterns in Biological Data, Graph Mining, Social Network Analysis.

UNIT VII

Business Intelligence and Information Exploitation: Why BI program ?, Taking advantage of Information Asset, Business Intelligence and Program Success, BI Defined, Actionable Intelligence, Analytics Spectrum, **The Business Intelligence Environment, Business Process and Information flow.**

UNIT VIII

Data Warehouses and the technical Business Intelligence Architecture:
Data modeling and Analytics, Analytical platform, operational data Stores, management**.**
Metadata: Introduction to metadata, Types of Metadata, Semantic metadata Processes for Business Analytics.
Data Profiling: Establishing Usability of candidate Data Sources, Data Profiling Activities, Data Model Inference, Attribute Analysis, Relationship Analysis.

TEXT BOOKS:

1. Jiawei Han and MichelineKamber, Morgan Kaufmann,*Data Mining: Concepts and Techniques*,Second Edition ,Publishers, Elsevier, 2006.
2. Pang-Ning Tan, Michael Steinbach and VipinKumar ,*Introduction to Data Mining,* Pearson Education.
3. David Loshin, *Business Intelligence: The Savvy Manager's Guide,*Second Edition

REFERENCES:

1. ArunKPujari,*Data Mining Techniques*, Second Edition, Universities Press.
2. Sam Aanhory& Dennis Murray ,*Data Warehousing in the Real World*, Pearson EdnAsia.
3. K.P.Soman, S.Diwakar,V.Ajay, *Insight into Data Mining*, PHI,2008.
4. PaulrajPonnaiah,*Data Warehousing Fundamentals,* Wiley Student Edition
5. Ralph Kimball ,*The Data Warehouse Life cycle Toolkit*, Wiley Student edition
6. William H Inmon,*Building the Data Warehouse by,* John Wiley & Sons Inc, 2005.
7. Margaret H Dunham ,*Data Mining Introductory and advanced topics*, Pearson Education

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12ACS31 **DISTRIBUTED SYSTEMS**

Objectives:

1. *To teach the principles underlying the functioning of distributed systems.*
2. *Create an awareness of the major technical challenges in distributed systems design and implementation.*
3. *Expose students to modern and classic technology used in distributed systems and their software.*

Outcomes:

At the end of the course, students should be able to:

1. *List the principles underlying the functioning of distributed systems, describe the problems and challenges associated with these principles.*
2. *Recognize how the principles are applied in contemporary distributed systems, implementation of typical algorithms used in distributed systems.*
3. *Design a distributed system that fulfills requirements with regards to key distributed system properties (such as scalability, transparency, etc.).*

UNIT I

Characterization of Distributed Systems, Networking and Internetworking – Types of network, Network principles, Internet protocols, Case studies.

UNIT II

Interprocess Communication: The API for Internet protocols, External data representation and marshalling, Client-Server Communication, Group Communication, IPC in UNIX.

UNIT III

Distributed Objects and Remote Invocation : Communication between distributed objects, Remote Procedure Call, Events and notifications, Case study – Java RMI.

UNIT IV

Operating System Support : The operating system layer, Protection, Process and threads, Communication and invocation, Operating system architecture.

UNIT V

Distributed File Systems : File service architecture, Sun Network File System, The Andrew File System.

UNIT VI

Name Services : Name services and the Domain Name System, Directory services, Synchronizing physical clocks, Logical time and logical clocks, Distributed debugging. Replication System model and group communication, Coordination and Agreement – Distributed mutual exclusion, Elections, Multicast communication.

Transactions Nested Transactions : Concurrency control in distributed transactions, Locks, Optimistic concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

UNIT VII

Distributed Transactions : Flat and nested distributed transactions, Atomic commit protocols, Concurrency control in distributed transactions, distributed Deadlocks,

Transactions with replicated data, Transaction recovery, Fault-tolerant services, Hierarchical and group masking of faults.

Cryptography, Authentication and key distribution, Logics of Authentication, Digital signatures.

UNIT VIII

Distributed shared memory, Design and Implementation issues, Sequential consistency and ivy, Release consistency and Munin, Overview of Distributed Operating systems Mach, Chorus.

TEXT BOOKS:

1. G Coulouris, J Dollimore and T Kindberg, *Distributed Systems Concepts and Design*, Fourth Edition, Pearson Education.

REFERENCES:

1.PradeepK.Sinha,*Distributed Operating Systems*,PHI.

2. M Singhal, N G Shivarathri,*Advanced Concepts in Operating Systems*, Tata McGraw-Hill Edition.

3.S.Ghosh,Chapman&Hall/CRC,*Distributed Systems*,Taylor&Francis Group,2010.

4. A.S. Tanenbaum and M.V. Steen ,*Distributed Systems – Principles and Paradigms,*

Pearson Education.

5. N.A.Lynch,*Distributed Algorithms,*Elsevier.

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12ACS32 ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS
(Common to CSE & IT)
(ELECTIVE – I)

Objectives:

1. *Provide you with an understanding of the role of Artificial Intelligence, Expert Systems and Decision Models in managerial decision-making.*
2. *Develop abilities to apply, build and modify decision models to solve real problems*
3. *Explore the issues involved in the design and development of Artificial Intelligence Based Decision Support Systems and discuss the role these systems play in the business environment.;*

Outcomes:

At the end of the course, students should be able to:

1. *to develop informed opinions about the present and past opinion leaders in the artificial intelligence debate.*
2. *to develop a simple, informal expert system by performing an effort of knowledge engineering of a real, human expert.*
3. *to develop a series of Web pages that will serve as a current "state of the art" review of the various AI application areas*

UNIT I

Overview of Artificial Intelligence: Definition& Importance of AI.

Knowledge General Concepts: Introduction, Definition and Importance of Knowledge, Knowledge-Based Systems, And Representation of Knowledge, Knowledge Organization, Knowledge Manipulation, And Acquisition of Knowledge.

UNIT II

LISP and Other AI Programming Languages: Introduction to LISP : Syntax and Numeric Function, Basic List Manipulation Functions in LISP, Functions, Predicates and Conditionals, Input, Output and Local Variables, Iteration and Recursion, Property Lists and Arrays, Miscellaneous Topics, PROLOG and Other AI Programming Languages.

UNIT III

Knowledge Representation: Introduction, Syntax and Semantics for Propositional logic, Syntax and Semantics for FOPL, Properties of Wffs, Conversion to Clausal Form, Inference Rules, The Resolution Principle, No deductive Inference Methods, Representations Using Rules.

UNIT IV

Dealing with Inconsistencies and Uncertainties: Introduction, Truth Maintenance Systems, Default Reasoning and the Closed World Assumption, Predicate Completion and Circumscription, Modal and Temporal Logics.

Probabilistic Reasoning: Introduction, Bayesian Probabilistic Inference, Possible World Representations, Dumpster-Shafer Theory, Ad-Hoc Methods.

UNIT V

Structured Knowledge: Graphs, Frames and Related Structures: Introduction, Associative Networks, Frame Structures, Conceptual Dependencies and Scripts.

Object-oriented Representations: Introduction, Overview of Objects, Classes, Messages and Methods, Simulation Example using an OOS Program.

UNIT VI

Search and Control Strategies: Introduction, Preliminary Concepts, Examples of Search Problems, Uninformed or Blind Search, Informed Search, Searching And-Or Graphs.

Matching Techniques: Introduction, Structures Used in Matching, Measures for Matching, Matching Like Patterns, Partial Matching.

UNIT VII

Knowledge Organization and Management: Introduction, Indexing and Retrieval Techniques, Integrating Knowledge in Memory, Memory Organization Systems.

UNIT VIII

Expert Systems Architectures: Introduction, Rule Based System Architecture, Non-Production System Architecture, Dealing with uncertainty, Knowledge Acquisition and Validation, Knowledge System Building Tools.

Text Book:

1. Dan W. Patterson - *Introduction to Artificial Intelligence and Expert Systems*, PHI, New Delhi, 2006.

Reference Books:

1. E. Rich & K. Knight - *Artificial Intelligence*, 2/e, TMH, New Delhi, 2005.
2. P.H. Winston - *Artificial Intelligence*, 3/e, Pearson Edition, New Delhi, 2006.
3. D.W. Rolston,-*Principles of AI & Expert System Development*, TMH, New Delhi.

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12ACS33 NEURAL NETWORKS AND FUZZY LOGIC

(ELECTIVE – I)

Objective :

1. *This course introduces the basics of Neural Networks and the essentials of Artificial Neural Networks with Single Layer and Multilayer Feed Forward Networks.*
2. *Also deals with Associate Memories and introduces Fuzzy sets and Fuzzy Logic system components.*
3. *The Neural Network and Fuzzy Network system application to Electrical Engineering is also presented. This subject is very important and useful for doing Project Work*.

Outcomes:

At the end of the course, students should be able to:

1. To expose the students to the concepts of feed forward neural networks.
2. To develop and implement a basic trainable neural network or a fuzzy logic system for a typical control, computing application.
3. To teach about the concept of fuzziness involved in various systems. To provide adequate knowledge about fuzzy set theory.

UNIT I

Introduction to Neural Networks : Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Hodgkin-Huxley Neuron Model, Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN.

UNIT II

Essentials of Artificial Neural Networks : Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Neural Dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules, Types of Application

UNIT III

Single Layer Feed Forward Neural Networks : Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications.

UNIT IV

Multilayer Feed forward Neural Networks : Credit Assignment Problem, Generalized Delta Rule, Derivation of Backpropagation (BP) Training, Summary of Backpropagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

UNIT V

Associative Memories : Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory (Associative Matrix, Association Rules, Hamming Distance, The Linear Associator, Matrix Memories, Content Addressable Memory), Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function, Proof of BAM Stability Theorem

Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis, Capacity of the Hopfield Network,Summary and Discussion of Instance/Memory Based Learning Algorithms, Applications.

UNIT VI

Classical & Fuzzy Sets : Introduction to classical sets - properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions.

UNIT VII

Fuzzy Logic System Components : Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

UNIT VIII

Applications : Neural network applications: Process identification, control, fault diagnosis and load forecasting.

Fuzzy logic applications: Fuzzy logic control and Fuzzy classification.

TEXT BOOK:

1. Rajasekharan and Rai , *Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications ,*PHI Publication.
2. S.N.Sivanandam, S.Sumathi,S.N.Deepa*,Introduction to Neural Networks using MATLAB 6.0 ,*TMH, 2006

REFERENCE BOOKS:

1. James A Freeman and Davis Skapura, *Neural Networks* –Pearson Education, 2002.
2. Simon Hakins,*Neural Networks*, Pearson Education
3. C.Eliasmith and CH.Anderson,*Neural Engineering* , PHI
4. Bart Kosko*, Neural Networks and Fuzzy Logic System*, PHI Publications.

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12ACS34 PATTERN RECOGNITION AND IMAGE PROCESSING

(ELECTIVE – I)

Objectives:

1. *Demonstrate the importance of pattern recognition and its applications*
2. *Illustrate the need for non–parametric decision making*
3. *Demonstrate the various types of clustering patterns and its differences*

Outcomes:

At the end of the course, students should be able to:

1. *Analyze various concepts of statistical decision used in pattern recognition .*
2. *Distinguish and identify the significance of various clustering patterns.*
3. *Understanding Bayes classified decision function for Baye's classifier.*

Unit I

The digitized image and its properties: Applications of image processing, image function, image representation, sampling, quantization, color images, metrics and topological properties of digital images, histograms, image quality, noise image.

UNIT II

Image preprocessing: Pixel brightness transformation, position dependent brightness correction, gray scale transformation; geometric transformation, local preprocessing- image smoothening, edge detectors, zero-crossing, scale in image processing, canny edge detection, parametric edge models, edges in multi spectral images, local pre-processing and adaptive neighborhood preprocessing; image restoration;

UNIT III

Image Segmentation: Threshold detection methods, optimal thresholding, multispectral thresholding, thresholding in hierarchical data structures; edge based image segmentation-edge image thresholding, edge relaxation, border tracing, border detection,

UNIT IV

Mathematical Morphology : Basic morphological concepts, four morphological principles, binary dilation, erosion, Hit or miss transformation, opening and closing; thinning and skeleton algorithms; Morphological segmentation -particles segmentation and watersheds, particles segmentation.

UNIT V

BASIC CONCEPTS : Pattern Recognition Systems, Fundamental Problems in pattern recognition system design, Design concepts and Methodologies: Character recognition ,Speech recognition, Fingerprint Recognition. Pattern Recognition Model

UNIT VI

DECISION FUNCTIONS : Linear Decision functions, Distance functions. Minimum distance and Maximum distance classification, clustering concepts, Cluster seeking algorithms, K- means Algorithms.

UNIT VII

BAYE'S CLASSIFIER: Bayes classified decision function for Baye's classifier, Baye's Classifier for normal patterns. Trainable pattern classifiers — deterministic approach, perception, approach - reward — punishment concept

UNIT VIII

GRADIENT APPROACH : Gradient approach, Gradient Descent algorithms, LMSE Algorithms, Multi category classification.

TEXT BOOKS:

1. MillanSonka, Vaclav Hiavac, Roger Boyle,*Image Processing Analysis and Machine Vision,*Vikas publishing House, Brooks/Cole.
2. Rafel C. Gonzalez, Richard E. Woods ,*Digital Image Processing,* Second edition,Pearson Education.
3. J.T.TOU.R.C. Gonzalez ,*Pattern Recognition Principles*, Addiscin Wesley.

REFERENCE BOOKS:

1. A.K. Jam, *Fundamentals of Digital Image Processing*, Pill Pearson Education
2. Earl Gose, Richard Johnsonbaugh,*Pattern Recognition and Image Analysis*, prentice Hall of India private limited, 1999.
3. Richard O. Duda, David G. Stork,*Pattern Classification*, 2nd Edition,Wiley India Edition.

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12ACS35 **GRID AND CLUSTER COMPUTING**
(ELECTIVE –II)

Objectives:

1. *This course presents an introduction to a new emerging paradigm: Grid Computing and cluster computing*
2. *To teach some of the application areas for grid computing and some existing examples of Cluster computing,*
3. *to teach services that must be provided by the grid infrastructure, including security, resource management, and information services and data management*

Outcomes:

At the end of the course, students should be able to:

1. *Understand the Web services- SaaS , Virtualizations.*
2. *Practically examine large-scale grid systems.*
3. *Understand Cloud Computing, Cloud Components and Applications .*

UNIT I

INRODUCTION: High Performance Computing - Cluster Computing - Meta-computing - Peer-to-Peer Computing - Internet Computing - Grid Computing – Types of grids - The Grid: Past, Present and Future - Grid Applications.

UNIT II

GRID COMPUTING TECHNOLOGY: Evolution of the Grid - Desktop Grids - Cluster Grids – HPC Grids – Computational and Data Grids.

UNIT III

ANATOMY OF THE GRID: Virtual organizations - Grid architecture – comparison with other distributed technologies – Autonomic computing – Service on demand – SOA and the Grid – Semantic grids - Service Virtualization – Infrastructure and applications.

UNIT IV

OPEN GRID SERVICE ARCHITECTURE: Evolution to OGSA - OGSA Infrastructure - OGSA Basic Services - Creating and Managing Grid Services - Managing Grid Environments - Grid-Enabled software applications - Grid-Enabled network services, Grid Security.

UNIT V

CLOUD COMPUTING: SOA - Web services- SaaS – Virtualisation - Ajax and Mashup – Map Reduce Model - Cloud computing architectures.

UNIT VI

Cloud Computing: Overview of Cloud Computing, Cloud Components ,Applications ,Hardware and Infrastructure, Accessing the cloud ,Cloud Storage ,Future of Cloud Computing .

UNIT VII

CASE STUDY: Globus Toolkit: Architecture - Programming model - Sample Implementation.

UNIT VIII

Context –Aware Computing and its applications, Introduction to Ad Hoc and Sensor Networks , Approaches to Security .

REFERENCES:

1. Ahmar Abbas, "*Grid Computing Practical Guide to Technology and Applications*", Firewall Media, New Delhi, 2008.
2. Joshy Joseph and Craig Fallenstein, "*Grid Computing*", Pearson Education, New Delhi, 2004
3. C S R Prabhu, "*Grid and Cluster Computing",* PHI Pvt Ltd, New Delhi, 2008.
4. Ian Foster and Carl Kesselman, "*The Grid: Blueprint for a New Computing Infrastructure",* Morgan Kaufman, New Delhi, 2006.
5. Fran Berman, Geoffrey Fox and Anthony Hey J G, *"Grid Computing Making the Global Infrastructure a Reality"*, Wiley, USA, 2003.
6. Janakiram , *Grid Computing* ,TMH Pu
7. Velte , *Cloud Computing* , McGraw Hill Pub

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12ACS36 **ADVANCED COMPUTER ARCHITECTURE**
(ELECTIVE –II)

Objectives:

1. *To Discuss the concept of parallel processing and the relationship between parallelism and performance.*
2. *Understand the organization of computer structures that can be electronically configured and reconfigured*
3. *Explain the concept of branch prediction its use in enhancing the performance of pipelined machines.*

Outcomes:

At the end of the course, students should be able to:

1. *Realize Parallelism and Parallel architectures.*
2. *Instruction Level Parallelism. hread level parallelism.*
3. *Memory requirements and design.*

Unit I

Fundamentals of Computer design : Technology trends- cost- measuring and reporting performance quantitative principles of computer design.

Unit II

Instruction sets principles and examples : classifying instruction set- memory addressing- type and size of the operands- addressing modes for signal processing-operations in the instruction set- instructions for controlFlow- encoding an instruction set.-the role of the compiler

Unit III

Instruction level parallelism (ILP) :over coming data hazards- reducing branch costs –high performance instruction delivery- hardware based speculation- limitation of ILP

Unit IV

ILP software approach : compiler techniques- static branch protection - VLIW approach - H.W support for more ILP at compile time- H.W verses S.W Solutions

Unit V

Memory hierarchy design : cache performance- reducing cache misses penalty and miss rate – virtual memory- protection and examples of VM.

Unit VI

Multiprocessors and thread level parallelism: symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

Unit - VII

Storage systems: Types – Buses - RAID- errors and failures- benchmarking a storage device- designing a I/O system.

Unit - VIII

Interconnection networks and clusters : interconnection network media – practical issues in interconnecting networks- examples – clusters- designing a cluster.

TEXT BOOK :

1.John L. Hennessy & David A,*Computer Architecture A quantitative approach*,3rd edition Patterson Morgan Kufmann (An Imprint of Elsevier)

REFERENCES :

1. Kai Hwang and A.Briggs"*Computer Architecture and parallel Processing*", International Edition McGraw-Hill.

2. SayedRoosta*,"Parallel Processing and Parallel Algorithms",* Springer series, USA, 1999.

3. Sima D, Fountain T and KacsukP*,"Advanced Computer Architectures: A Design Space Approach* ", Addison Wesley, USA, 2000.

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12ACS37 NETWORK MANAGEMENT SYSTEMS
(ELECTIVE –II)

Objectives:

1. *The objective of this course is to provide a basic understanding of how the information in the networks is planned, managed, administered, and operated.*
2. *To Understand general concepts and architecture behind standards based network management*
3. *To Understand concepts and terminology associated with SNMP and TMN*

Outcomes:

At the end of the course, students should be able to:

1. *Understand Advanced Information Processing Techniques such as Distributed Object Technologies, Software Agents and Internet Technologies used for network management.*
2. *Understand the management framework of E-business.*
3. *Get a feeling of current trends in network management technologies*

UNIT I

System Design: Introduction, Resource constraints and their metrics, Common design techniques, Performance Analysis And Tuning.

UNIT II

Network Management Tools: Network Management Tools: Tools Catalog, Bit Error Rate Tester, Basics Software,Tools, SNMP MIB Tools, The Protocol Analyzer ,Network Statistics Measurement Systems: Traffic Load Monitoring, Protocol Statistics, Data and Error Statistics, Using MRTG to Collect Traffic Statistics

UNIT III

Network Management Systems: History of Enterprise Management.Functional Components, Multiple NMS Configuration, Network Management System,Requirements:Commercial Network Management Systems: Hewlett-Packard's Open View Network Node Manager, Cabletron's Spectrum platform, Sun Network Management Systems Family System Management : High-End System management, Low-End System management, Enterprise Management Solutions, Computer Associates Unicenter TNG , Tivoli Enterprise manager.

UNIT IV

Network Management Applications: Configuration Management: Network Provisioning, Inventory Management ,Network Topology. Fault Management: Fault detection, Fault location and isolation Techniques.Performance Management: Performance Metrics, Data Monitoring, Problem Isolation, Performance Statistics.

UNIT V:

Event Correlation Techniques: Rule-Based Reasoning, Model-Based Reasoning, Case-Based Reasoning, Codebook,Correlation Model, State Transition Graph model , Finite State Machine Model.

UNIT VI

Web-Based Management: NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based management , Desktop Management Interface, Web-Based Enterprise management.

UNIT VII

WBEM: Windows Management Instrumentation.

Java Management Extensions: Service-Driven Network, Java Dynamic Management Kit, JMXArchitecture.Management of a Storage Area Network: The Jiro Platform. Future Directions.

UNIT VIII

Flow Control: Model , Classification, Open-loop flow control, Closed-loop flow control, Hybrid flow control ,Taffic Management: Introduction, An economic framework for traffic management, Traffic models, Traffic classes,Time scales of traffic management, Scheduling , Renegotiation , Signaling, Admission Control, Peak-load pricing,Capacity planning.

Text Books:

1.*Subramanian,Network Management (Principles and Practice)* , Pearson Education Asia.

2nd edition.

2. S.Keshav,*An engineering approach to computer Networking*, Pearson Education Asia.4th

edition.

3. Douglas E. Comer ,*Computer Networks and Internets,* Pearson Education, 2nd Edition.

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12ACS41 SOFTWARE TESTING AND CASE TOOLS LAB

1. Write programs in 'C' Language to demonstrate the working of the following constructs:

   i) do...while ii) while….do iii) if…else iv) switch v) for

2. "A program written in 'C' language for Matrix Multiplication fails" Introspect the causes for its failure and write down the possible reasons for its failure.
3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
4. Write the test cases for any known application (e.g. Banking application)
5. Create a test plan document for any application (e.g. Library Management System)
6. Study of any testing tool (e.g. Win runner)
7. Study of any web testing tool (e.g. Selenium)
8. Study of any bug tracking tool (e.g. Bugzilla, bugbit)
9. Study of any test management tool (e.g. Test Director)
10. Study of any open source-testing tool (e.g. Test Link)
11. Take a mini project (e.g. University admission, Placement Portal) and executes it. During the Life cycle of the mini project create the various testing documents* and final test report document.

*Note: To create the various testing related documents refer to the text "Effective Software Testing Methodologies by William E. Perry"

Case Tools

Students are divided into batches of 5 each and each batch has to draw the following diagrams using UML for an ATM system whose description is given below.

UML diagrams to be developed are:

1. Use Case Diagram.
2. Class Diagram.
3. Sequence Diagram.
4. Collaboration Diagram.
5. State Diagram
6. Activity Diagram.

7. Component Diagram
8. Deployment Diagram.
9. Test Design.

Description for an ATM System

The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.
2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance inquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.)

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully

enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back.

If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction.

The ATM will provide the customer with a printed receipt for each successful transaction

The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer. When the switch is moved to the "off" position, the machine will shut down, so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts, etc.

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12ACS42 **DATA MINING LAB**
(Common to CSE & IT)

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.

2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.

3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.

4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.**The German Credit Data**:

Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such data set, consisting of 1000 actual cases collected in Germany. Credit dataset (original) Excel spreadsheet version of the German credit data (Down load from web).

In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer !)

A few notes on the German dataset

• DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).

• owns_telephone. German phone rates are much higher than in Canada so fewer people own telephones.

• foreign_worker. There are millions of these in Germany (many from Turrkey). It is very hard to get German citizenship if you were not born of German parents.

• There are 20 attributes used in judging a loan applicant. The goal is the classify the applicant into one of two categories, good or bad.**Subtasks : (Turn in your answers to the following tasks)**

1. List all the categorical (or nominal) attributes and the real-valued attributes separately.

2. What attributes do you think might be crucial in making the credit assessment? Come up with some simple rules in plain English using your selected attributes.

3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.

4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly ? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy ?

5. Is testing on the training set as you did above a good idea ? Why or Why not ?

6. One approach for solving the problem encountered in the previous question is using cross validation ? Describe what is cross-validation briefly. Train a Decistion Tree again using cross-validation and report your results. Does your accuracy increase/decrease ?Why ? (10 marks)

7. Check to see if the data shows a bias against "foreign workers" (attribute 20),or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss.

8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the arff data file to get all the attributes initially before you start selecting the ones you want.)

9. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifcations equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?

10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees ? How does the complexity of a Decision Tree relate to the bias of the model ?

11. You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain ? Also, report your accuracy using the pruned model. Does your accuracy increase ?

12. (Extra Credit): How can you convert a Decision Tree into "if-then-else rules". Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules.PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one ! Can you predict what attribute that might be in this dataset ?OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and one R.

13. Derive association rules from the following dataset.

Outlook	**Temperature**	**Humidity**	**Windy**	**Play**
Sunny	Hot	High	False	No
Sunny	Hot	High	True	No
Overcast	Hot	High	False	Yes
Rainy	Mild	High	False	Yes
Rainy	Cool	Normal	False	Yes
Rainy	Cool	Normal	True	No
Overcast	Cool	Normal	True	Yes
Sunny	Mild	High	False	No
Sunny	Cool	Normal	False	Yes
Rainy	Mild	Normal	False	Yes
Sunny	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Rainy	Mild	High	True	No

14. Perform Clustering on Weather nominal data set

i. Open Weka and Load the data set editor. Get familiarize with the editor operations.

a. Load the weather. Nominal dataset. Use the filter weka. Unsupervised, instance. Remove with Values to remove all instances in which the humidity attribute has the value high. To do this, first make the field next to the Choose button show the text Remove with Values. Then click on it to get the Generic Object .Editor window, and figure out how to change the filter settings appropriately.

b. Undo the change to the dataset that you just performed, and verify that the data has reverted to its original state.

ii. Choosing k-means clustering algorithm for clustering use the Cancer data (.arff) perform clustering with a Euclidean distance functions and visually inspect the nature of the clusters.

15. Classification

i. Choosing an appropriate filter for classification use the Iris data (.arff) perform classification and visualize the classification tree.

ii. The glass dataset glass.arff from the U.S. Forensic Science Service contains data on six types of glass. Glass is described by its refractive index and the chemical elements that it contains; the aim is to classify different types of glass based on these features. This dataset is taken from the UCI datasets, which have been collected by the University of California at Irvine and are freely available on the Web. They are often used as a benchmark for comparing data mining algorithms. Find the dataset glass.arffand load it into the Explorer interface. For your own information, answer the following exercises. How many attributes are there in the dataset? What are their names? What is the class attribute? Run the classification algorithm IBk (weka.classifiers.lazy.IBk). Use cross-validation to test its performance.

Task Resources:

Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)

- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
- Weka resources:
  - Introduction to Weka (html version) (download ppt version)
  - Download Weka
  - Weka Tutorial
  - ARFF format
  - Using Weka from command line

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12ACS44 **SOFTWARE PATTERNS**

Objectives :

1. *Patterns identify and specify abstractions that are above the level of single classes and instances, or of components.*
2. *Patterns provide a common vocabulary and understanding of design principles.*

Outcomes:

1. *Students could able to design a software with defined properties.*
2. *Understanding how to build complex and heterogeneous software architectures*.

UNIT –I

Introduction to 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, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary .

UNIT-III

Creational Patterns : Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT-IV

Structural Pattern Part-I : Adapter, Bridge, Composite.

UNIT-V

Structural Pattern Part-II : Decorator, açade, Flyweight, Proxy.

UNIT-VI

Behavioral Patterns Part-I : Chain of Responsibility, Command, Interpreter, Iterator.

UNIT-VII

Behavioral Patterns Part-II : Mediator, Memento, Observer, State, Strategy, Template Method ,Visitor, Discussion of Behavioral Patterns.

UNIT-VIII

What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

TEXT BOOK :

1. Erich Gamma ,*Design Patterns*, Pearson Education

REFERENCES :

1.Mark Grand,*Pattern's in JAVA Vol-I*,WileyDreamTech.
2. Mark Grand,*Pattern's in JAVA Vol-II*,WileyDreamTech.
3. Mark Grand,*JAVA Enterprise Design Patterns Vol-III*,WileyDreamTech.
4.Eric Freeman,*Head First Design Patterns* -Oreilly-spd
5. Alan Shalloway*,Design Patterns Explained*,Pearson Education.

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	4	**1**	**-**	**4**

12ACS38 **SOFTWARE PROJECT MANAGEMENT**
(Elective-III)

Objectives:

1. *To Define and highlight the importance of software project management.*
2. *To Describe the software project management activities.*
3. *To teach Model Based Software Architectures in A Management Perspective and Technical Perspective*.

Outcomes:

At the end of the course, students should be able to:

1. *Understand Life Cycle Phases: Engineering and Production Stages, Inception. Elaboration, Construction, Transition.*
2. *Understand Software Process Workflows.*
3. *Understand Cost and Schedule Estimating, Interaction Planning Process, Pragmatic Planning.*

UNIT I

Conventional Software Management: The Waterfall Model, Conventional software Management Performance. Evolution of Software Economics: Software Economics, Pragmatic Software Cost Estimation.

UNIT II

Improving Software Economics: Reducing Software Product Size, Improving software Processes, Improving Team Effectiveness, Improving Automation, Achieving Required Quality, Peer Inspections.

UNIT III

Conventional and Modern Software Management: Principles of Conventional Software Engineering, Principles of Modern Software Management, Transitioning to an Iterative Process. Life Cycle Phases: Engineering and Production Stages, Inception. Elaboration, Construction, Transition Phases.

UNIT IV

Artifacts of The Process: The Artifact Sets. Management Artifacts, Engineering Artifacts, Programmatic Artifacts. Model Based Software Architectures: A Management Perspective and Technical Perspective.

UNIT V

Flows of The Process: Software Process Workflows. Inter Trans Workflows. Checkpoints of the Process : Major Mile Stones, Minor Milestones, Periodic Status Assessments. Interactive Process Planning: Work Breakdown Structures, Planning Guidelines, Cost and Schedule Estimating. Interaction Planning Process. Pragmatic Planning.

UNIT VI

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, and Evolution of Organizations. Process Automation: Automation Building Blocks, The Project Environment.

UNIT VII

Project Control and Process Instrumention: Server Care Metrics, Management Indicators, Quality Indicators, Life Cycle Expectations Pragmatic Software Metrics, Metrics Automation. Tailoring the process: Process Discriminates, Example.

UNIT VIII

Modern Project Profiles Next Generation Software economics, Modern Process Transitions. Case Study: The Command Center Processing and Display System –Replacement (CCPDS-R)

TEXT BOOKS:

1. Walker Rayce, *Software Project Management*, 1998, PEA.

2. Henrey,*Software Project Management*, Pearson.

REFERENCES:

1. Richard H. Thayer, *Software Engineering Project Management*, 1997, IEEE Computer Society.

2. Shere K. D ,*Software Engineering and Management,*1998, PHI.

3. S. A. Kelkar,*Software Project Management: A Concise Study,* , PHI.

4. Hughes Cotterell,*Software Project Management*, Second Edition, , TMH.

5. Kaeron Conway, *Software Project Management from Concept to Development,* Dream Tech.

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12ACS45 **SOFTWARE ARCHITECTURE**
(Elective-III)

Objectives:

1. *To Teach Software architecture terminology; architecture in the system development life cycle; architecture dimensions; physical versus logical architectures.*
2. *To examine and compare various architecture view types and styles;*
3. *To Teach software architectural patterns and their relationship to system qualities*

Outcomes:

At the end of the course, students should be able to:

1. *understand the role of a software architecture in the development of an enterprise application system;*
2. *Recognize major software architectural styles, design patterns, and frameworks.*
3. *Describe a software architecture using various documentation approaches and architectural description languages*

UNIT I

INTRODUCTION: The Architecture Business Cycle: Where do architectures come from? Software processes and the architecture business cycle; What makes a "good" architecture? What software architecture is and what it is not; Other points of view; Architectural patterns, reference models and reference architectures; Importance of software architecture; Architectural structures and views.

UNIT II

ARCHITECTURAL STYLES AND CASE STUDIES: Architectural styles; Pipes and filters; Data abstraction and object-oriented organization; Event-based, implicit invocation; Layered systems; Repositories; Interpreters; Process control; Other familiar architectures; Heterogeneous architectures. Case Studies: Keyword in Context; Instrumentation software; Mobile robotics; Cruise control; Three vignettes in mixed style.

UNIT III

QUALITY: Functionality and architecture; Architecture and quality attributes; System quality attributes; Quality attribute scenarios in practice; Other system quality attributes; Business qualities; Architecture qualities.

Achieving Quality: Introducing tactics; Availability tactics; Modifiability tactics; Performance tactics; Security tactics; Testability tactics; Usability tactics; Relationship of tactics to architectural patterns; Architectural patterns and styles.

UNIT IV

ARCHITECTURAL PATTERNS – 1: Introduction; from mud to structure: Layers, Pipes and Filters, Blackboard.

UNIT V

ARCHITECTURAL PATTERNS – 2: Distributed Systems: Broker; Interactive Systems: MVC, Presentation-Abstraction-Control.

UNIT VI

ARCHITECTURAL PATTERNS – 3: Adaptable Systems: Microkernel; Reflection.

UNIT VII

SOME DESIGN PATTERNS: Structural decomposition: Whole – Part; Organization of work: Master – Slave; Access Control: Proxy.

UNIT VIII

DESIGNING AND DOCUMENTING SOFTWARE ARCHITECTURE: Architecture in the life cycle; designing the architecture; Forming the team structure; Creating a skeletal system.Uses of architectural documentation; Views; choosing the relevant views; Documenting a view; Documentation across views.

TEXT BOOKS:

1. Len Bass, Paul Clements, Rick Kazman, *Software Architecture in Practice*, 2nd Edition, Pearson Education, 2003.
2. Frank Buschmann, RegineMeunier, Hans Rohnert, Peter Sommerlad, Michael Stal,*Pattern-Oriented Software Architecture, A System of Patterns - Volume 1* –, John Wiley and Sons, 2006.
3. Mary Shaw and David Garlan: *Software Architecture- Perspectives on an Emerging Discipline,* Prentice-Hall of India, 2007.

REFERENCES:

1. Garmus, Herros, " *Measuring the Software Process: A Practical Guide to Functional Measure"*, 1996, PHI.
2. Florac, Carleton, "*Meas. Software Process: Stat. Proce. Cont. for Software process Improvemnts",* 1999, PEA.
3. W.Humphery, " *Introduction to Team Software Process",* 2002, PEA.

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12ACS46 **INFORMATION RETRIEVAL SYSTEMS**
(Elective-III)

Objectives:

1. *To teach basic concepts related to information storage and retrieval.*
2. *To teach in developing automated information retrieval systems and its development.*
3. *Explores information retrieval systems' evaluation tools.*

Outcomes:

At the end of the course, students should be able to:

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

UNIT I

Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses,

Information Retrieval System Capabilities -Search, Browse, Miscellaneous.

UNIT II

Cataloging and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction

Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure –

UNIT III

Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages

Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters

UNIT IV

User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, Weighted searches of Boolean systems, Searching the Internet and hypertext –

Information Visualization: Introduction, Cognition and perception, Information visualization technologies

UNIT V

Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems.

Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

UNIT VI

Parallel and Distribute IR : Parallel Computing, Performance Measures, Parallel IR - MIMD and SIMD Architectures, Distributed IR – Collection Partitioning, Source Selection, Query Processing, Web Issues, Trends and Research Issues.

UNIT VII

Multimedia Information Retrieval : Models and Languages – Data Modeling, Query Languages, Indexing and Searching

UNIT VIII

Libraries and Bibliographical Systems: Online IR Systems, OPACs, Digital Libraries.

TEXT BOOKS:

1. Kowalski, Gerald, Mark T MayburyKluwer ,*Information Storage and Retrieval Systems: Theory and Implementation* , Academic Press, 2000.
2. Ricardo Baeza-Yates,*Modern InformationRetrieval* , Pearson Education, 2007.
3. David A Grossman and OphirFrieder,*Information Retrieval: Algorithms and Heuristics*, 2nd Edition, Springer International Edition, 2004.

REFERENCES :

1. William B Frakes, Ricardo Baeza-Yates,*Information Retrieval Data Structures and Algorithms,* Pearson Education, 1992.
2. Robert Korfhage,*Information Storage &Retieval ,* John Wiley & Sons.
3. Christopher D. Manning and PrabhakarRaghavan,*Introduction to Information Retrieval* , Cambridge University Press, 2008.

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B. Tech. IV-II - Sem.(C.S.E)	**L**	**T**	**P**	**C**
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12ACS40 **WIRELESS ADHOC NETWORKS**
(Elective-IV)

Objectives:

1. *To teach the constraints of the wireless physical layer that affect the design and performance of ad hoc networks, protocols, and applications.*
2. *To understand MAC, Routing protocols that have been proposed for ad hoc networks.*
3. *To understand the energy issues in Adhoc networks and how they can be addressed using scheduling, media access control, and special hardware.*

Outcomes:

At the end of this course the student should be able to:

1. *Understand need for ad hoc networks.*
2. *Understand design issues for ad hoc networks.*
3. *Understand security issues and QoS requirements.*

UNIT - I

Ad hoc Networks: Introduction, Issues in Ad hoc wireless networks, Ad hoc wireless internet.

UNIT II

MAC – 1: MAC Protocols for Ad hoc wireless Networks: Introduction, Issues in designing a MAC protocol for Ad hoc wireless Networks, Design goals of a MAC protocol for Ad hoc wireless Networks, Classification of MAC protocols, Contention based protocols with reservation mechanisms.

UNIT III

MAC – 2: Contention-based MAC protocols with scheduling mechanism, MAC protocols that use directional antennas, Other MAC protocols.

UNIT IV

ROUTING 1: Routing protocols for Ad hoc wireless Networks: Introduction, Issues in designing a routing protocol for Ad hoc wireless Networks, Classification of routing protocols, Table drive routing protocol, On-demand routing protocol.

UNIT V

ROUTING 2: Hybrid routing protocol, Routing protocols with effective flooding mechanisms, Hierarchical routing protocols, Power aware routing protocols.

UNIT VI

TRANSPORT LAYER: Transport layer protocols for Ad hoc wireless Networks: Introduction, Issues in designing a transport layer protocol for Ad hoc wireless Networks, Design goals of a transport layer protocol for Ad hoc wireless Networks, Classification of transport layer solutions,

TCP over Ad hoc wireless Networks, Other transport layer protocols for Ad hoc wireless Networks.

UNIT VII

SECURITY: Security in wireless Ad hoc wireless Networks, Network security requirements, Issues & challenges in security provisioning, Network security attacks, Key management, Secure routing in Ad hoc wireless Networks.

UNIT VIII

Quality of service in Ad hoc wireless Networks: Introduction, Issues and challenges in providing QoS in Ad hoc wireless Networks, Classification of QoS solutions, MAC layer solutions, network layer solutions.

TEXT BOOK:

1. C. Siva Ram Murthy & B. S. Manoj,*Ad hoc Wireless Networks* , 2nd Edition, Pearson Education, 2005.

REFERENCE BOOKS:

1. Ozan K. Tonguz and Gianguigi Ferrari, *Ad hoc Wireless Networks*, John Wiley, 2006.

2. Xiuzhen Cheng, Xiao Hung, Ding-Zhu Du, Kluwer , *Ad hoc Wireless Networking,* Academic Publishers, 2004.

3. C.K. Toh,*Adhoc Mobile Wireless Networks Protocols and Systems*, Prentice-Hall PTR, 2002.

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12ACS47 **STORAGE AREA NETWORKS**
(Elective-IV)

Objectives:

1. *Understand Storage Area Networks characteristics and components.*
2. *To Learn Local, Network, shared disk file system.*
3. *To teach The Data Storage and Data Access problem*

Outcomes:

At the end of this course the student should be able to:

1. *Understand Server, storage-Centric IT Architecture.*
2. *Understand important storage technologies' features such as availability, replication, scalability and performance,*
3. *Identify and install current storage virtualization technologies .*

UNIT – I

INTRODUCTION: Server Centric IT Architecture and its Limitations; Storage – Centric IT Architecture and its advantages; Case study: Replacing a server with Storage Networks; The Data Storage and Data Access problem; The Battle for size and access.

UNIT - II

INTELLIGENT DISK SUBSYSTEMS - 1: Architecture of Intelligent Disk Subsystems; Hard disks and Internal I/O Channels, JBOD, Storage Virtualization using RAID and different RAID levels;

UNIT - III

I/O TECHNIQUES - 1: Caching: Acceleration of Hard Disk Access; Intelligent disk subsystems; Availability of disk subsystems. The Physical I/O path from the CPU to the Storage System; SCSI.

UNIT - IV

I**/O TECHNIQUES – 2 :** NETWORK ATTACHED STORAGE: Fibre Channel Protocol Stack; Fibre Channel SAN; IP Storage. The NAS Architecture, The NAS hardware Architecture, The NAS Software Architecture, Network connectivity, NAS as a storage system.

UNIT - V

FILE SYSTEM AND NAS: Local File Systems; Network file Systems and file servers; Shared Disk file systems; Comparison of fibre Channel and NAS.

UNIT - VI

STORAGE VIRTUALIZATION: Definition of Storage Virtualization; Implementation Considerations; Storage Virtualization on Block or file level; Storage Virtualization on various levels of the storage Network; Symmetric and Asymmetric storage Virtualization in the Network

UNIT - VII

SAN ARCHITECTURE AND HARDWARE DEVICES: Overview, creating a Network for storage; SAN Hardware devices, The fibre channel switch, Host Bus adaptors; Putting the storage in SAN; Fabric operation from a Hardware perspective.

UNIT - VIII

SOFTWARE COMPONENTS OF SAN: The switch's Operating system, Device Drivers, The Supporting the switch's components, Configuration options for SANs. Panning for business continuity.

TEXT BOOKS:

1. Ulf Troppens, Rainer Erkens and Wolfgang Muller,*Storage Networks Explained*, John Wiley & Sons, 2003.
2. Robert Spalding,*Storage Networks: The Complete Reference* , Tata McGraw Hill, 2003.

REFERENCE BOOKS:

1. Richard Barker and Paul Massiglia,*Storage Area Network Essentials: A Complete Guide to understanding and Implementing SANs*–, John Wiley India, 2002.
2. Marc Farley,*Storage Networking Fundamentals,* Cisco Press, 2005.

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12ACS48 MULTIMEDIA APPLICATION DEVELOPMENT
(Elective-IV)

Objectives:

1. *To teach basics of multimedia technologies, various image formats and their features.*
2. *To teach Fundamentals of digital image and video compression techniques .*
3. *To Familiarization with various multimedia applications in various environments.*

Outcomes:

At the end of this course the student should be able to:

1. *Understand the importance, use and working of multimedia technology*
2. *apply various compression techniques, Apply various critical concepts of virtual reality in various environments*
3. *Analyze and apply appropriate multimedia technology where required*

UNIT I

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

UNIT II

Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

UNIT III

Action Script I: ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classes, Authoring an ActionScript Class.

UNIT IV

Action Script II : Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions.

UNIT V

Application Development : An OOP Application Frame work, Using Components with ActionScriptMovieClip Subclasses.

UNIT VI

Multimedia data compression : Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

UNIT - VII

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

UNIT - VIII

Multimedia Networks: Basics of Multimedia Networks, Multimedia Network Communications and Applications : Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand(MOD).

TEXT BOOKS :

1. Ze-Nian Li and Mark S, *Fundamentals of Multimedia*. Drew PHI/Pearson Education.

2. Colin Moock*, Essentials ActionScript 2.0*, SPD O,REILLY.

REFERENCES :

1. Nigel Chapman and Jenny Chapman*, Digital Multimedia*, Wiley-Dreamtech

2. *Macromedia Flash MX Professional 2004* Unleashed, Pearson.

3. Steve Heath,*Multimedia and communications Technology,* Elsevier(Focal Press).

4. Steinmetz, Nahrstedt, *Multimedia Applications,* Springer.

5. Weixel,*Multimedia Basics*, Thomson

6. David Hilman,*Multimedia Technology and Applications,* Galgotia

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12ACS39 COMPUTER SIMULATION & MODELING
(Elective-V)

Objectives:

1. *The objective of the course is to establish a fundamental understanding of the use of discrete-event simulation for modeling and analyzing appropriate problems in industrial engineering contexts.*
2. *Be able to describe, model, and document a problem in preparation for the application of simulation solution techniques*
3. *Be able to recognize, model, and analyze typical queueing scenarios*

Outcomes:

At the end of this course the student should be able to:

1. *analyze, model, and select appropriate input distributions*
2. *Understand simulation time advance mechanisms.*
3. *Understand appropriate simulation statistical output techniques.*

UNIT I

Introduction to Simulation: System and System environment, Components of a system, Type of systems, Type of models, Steps in a simulation study, Advantages and Disadvantages of simulation.

UNIT II

Simulation Examples: Simulation of Queueing systems, Other examples of Simulation-General Principles: Concepts of discrete event simulation, List processing,
Simulation Software: History of simulation software, Desirable software features, General-purpose simulation packages, Object oriented simulation, Trends in simulation software.

UNIT III

Statistical Models in Simulation: Useful statistical model, Discrete distribution, Continuous distribution, Poisson process, Empirical distribution.
Queueing Models: Characteristics of Queueing systems, Queueing notations, Long run measures of performance of Queueing systems, Steady state behavior of infinite population Markovian models, Steady state behavior finite population model, Network of Queues.

UNIT IV

Random Number Generation: Properties of random numbers, Generation of pseudo random numbers, Techniques for generating random numbers, Tests for random numbers.
Random Variate Generation: Inverse transforms technique, Convolution method, Acceptance rejection techniques.

UNIT V

Input Modeling: Data Collection, Identifying the Distribution of data, Parameter estimation, Goodness of fit tests, Selection input model without data, Multivariate and Time series input models.

UNIT VI

Verification and Validation of Simulation Model: Model building, Verification, and Validation, Verification of simulation models, Calibration and Validation of models.

Output Analysis for a Single Model: Types of simulations with respect to output analysis, stochastic nature of output data, Measure of performance and their estimation, Output analysis of terminating simulators, Output analysis for steady state simulation

UNIT VII

Comparison and Evaluation of Alternative System Design: Comparison of two system design, Comparison of several system design, Meta modeling, Optimization via simulation.

UNIT VIII

Case Studies: Simulation of manufacturing systems, Simulation of computer systems, Simulation of supermarket, Simulation of pert network

Text Books:

1. Jerry Banks, John Carson, Barry Nelson, David Nicol, "*Discrete Event System Simulation*"
2. Averill Law, W. David Kelton, "*Simulation Modeling and Analysis*", McGraw-HILL.

References:

1. Geffery Gordon, "*System Simulation*", PHI
2. Bernard Zeigler, Herbert Praehofer, Tag Gon Kim, *"Theory of Modeling and Simulation", Academic Press.*
3. NarsingDeo, *"System Simulation with Digital Computer*", PHI
4. Donald W. Body, "*System Analysis and Modeling*", Academic Press Harcourt India
5. W David Kelton, Randall Sadowski, Deborah Sadowski, "*Simulation with Arena"*, McGraw-HILL.

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12AEC45 CELLULAR AND MOBILE COMMUNICATIONS

(Common to ECE & CSE)

Objectives:

1. *To Illustrate the cellular concept in mobile communication.*
2. *To Apply the cellular concept to improve capacity in cellular systems with limited radio spectrum.*
3. *To understand GSM architecture and various multiple access schemes.*

Outcomes:

On completion of the course the student will be able to

1. *Understand cellular concept in mobile communication systems.*
2. *Analyze the significance of improving capacity in cellular systems with limited radio spectrum.*
3. *Understand the concept of radio wave propagation to calculate the link power budget.*

UNIT I

CELLULAR MOBILE RADIO SYSTEMS:

Introduction to Cellular Mobile system, performance criteria, uniqueness of mobile radio environment, operation of cellular systems, Hexagonal shaped cells, Analog and Digital Cellular systems.

UNIT II

ELEMENTS OF CELLULAR RADIO SYSTEM DESIGN:

General description of the problem, concept of frequency channels, Co-channel Interference Reduction Factor, desired C/I from a normal case in a Omni directional Antenna system, Cell splitting, consideration of the components of cellular system.

UNIT III

INTERFERENCE:

Introduction to Co-channel interference, real time co-channel interference, Co-channel measurement, design of Antenna system, Antenna parameters and their effects, diversity receiver, non-co-channel interference-different types.

UNIT IV

CELL COVERAGE FOR SIGNAL AND TRAFFIC:

Signal reflections in flat and hilly terrain, effect of human made structures, phase difference between direct and reflected paths, constant standard deviation, straight line path loss slope, general formula for mobile propagation over water and flat open area, near and long distance propagation antenna height gain, form of a point to point model.

UNIT V

CELL SITE AND MOBILE ANTENNAS:

Sum and difference patterns and their synthesis, Omni directional antennas, directional antennas for interference reduction, space diversity antennas, umbrella pattern antennas, minimum separation of cell site antennas, high gain antennas.

UNIT VI

FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT:

Numbering and grouping, setup access and paging channels channel assignments to cell sites and mobile units, channel sharing and borrowing, sectorization, overlaid cells, non fixed channel assignment.

UNIT VII

HANDOFF:

Handoff, dropped calls and cell splitting, types of handoff, handoff invitation, delaying handoff, forced handoff, mobile assigned handoff. Intersystem handoff, cell splitting, micro cells, vehicle locating methods, dropped call rates and their evaluation.

UNIT VIII

DIGITAL CELLULAR NETWORKS:

GSM architecture, GSM channels, multiple access scheme, TDMA, CDMA.

TEXT BOOKS:

1. W .C. Y. Lee, Mobile Cellular Telecommunications, Tata Mc-Graw Hill, 2nd Edition, 2006.
2. Theodore. S. Rappaport, Wireless Communications, Pearson Education, 2nd Edn., 2002.

REFERENCES:

1. Gordon L. Stuber, Principles of Mobile communications, Springer International 2nd Edition, 2007.
2. Lee, Wireless and Mobile Communications, Mc Graw Hills, 3rd Edition, 2006.
3. Jon W.Mark and Weihua Zhqung, Wireless communications and Networking, PHI, 2005.
4. R.Blake, Wireless Communication Technology, Thompson Asia Pvt. Ltd., 2004.

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12AIT10 **PRINCIPLES OF NANO TECHNOLOGY**
(Elective-V)

OBJECTIVES:

1. *Teaching the main concepts and principles about solid state physics and instructing about the electrical, thermal and structural analysis of crystal materials.*
2. *To teach about lunar soil samples using a high-powered X-ray technique. and also to find* out *how exactly these* nano particles *were formed inside the* glass *bubbles.*
3. *To teach about Nanotechnology-Enabled Sensor from knowledge of sciences, technology and mathematics.*

OUTCOMES:

Students will be able to;

1) Answer the questions such as what is solid state physics, what does it investigate.
2) Distinguish the crystal structures and their properties.
3) The student will have an idea of future nano electronic device technologies, Photonics.

UNIT I

Introduction to Physics of the Solid States, Methods of Measuring Properties &: Properties of Individual Nanoparticles Structure, energy bands, localized particles. Structures, microscopy, spectroscopy. Metal nanoclusters, semiconducting nanoparticles, rare gas and molecular clusters, methods of synthesi.

UNIT II

Mechanical, Magnetic, Electrical & Optical Properties: Strength of nano crystalline SiC, preparation for strength measurements, mechanical properties, magnetic properties. Super-paramagnetism, material preparation, magnetization of nano particles of magnetite, Mossbauer data of nano particles of magnetite, ESR spectroscopy, small angle neutron scattering. Switching glasses with nanoparticles, Electronic conduction with nano particles. Optical properties, special properties and the coloured glasses.

UNIT III

Investigating and manipulating materials in the Nanoscale: Electron microscopics, scanning probe microscopicscc, optical microscopics for nano science and technology, X-ray diffraction.

UNIT IV

Light energy, its capture, and photovoltaics, light production, light transmission, light control and manipulation, electronics, carbon nano tubes, soft molecule electronics, memories, gates & switches, architectures.

UNIT V

Nanotechnology-Enabled Sensor: Possibilities, relentless integration, advances in processing, diverse nano materials, new tools, realities, intensified design problems, the risk of

commercialization, diverse applications.

UNIT VI

Microelectronics: Introduction, nano manufacturing product strategy, considering future impacts, identifying potential synergies, existing technologies, future nano electronic device technologies, photonics.

UNIT VII

Smarter Computers, Faster Internet, Cheaper Energy: Building a better Digital brain, routing information at the speed of light, nano flying electronics, getting energy and a cleaner environment with nanotech.

UNIT VIII

Nano business and you: Boom, Bust, and nanotechnology:-
The next industrial revolution?, nano business today, high tech, Biotech, Nanotech:- here and now, the nature of ethics, ethics of individual behavior, nano ethics, converging technologies, practical responses, promises of nanotechnology.

Reference Books:

1. Introduction to Nanotechnology. C. P. Poole and F. J. Owens, Wiley.
2. Nano Materials, A. K. Bandyopadhyay, New Age International Publishers.
3. Nano Essentials, T. Pradeep, TMH.
4. Nanotechnology: A Gentle Introduction to the Next Big Idea., M. Ratner and D. Ratner, Pearson Education.
5. Nanotechnology. Science, Innovation, and Opportunity., L. E. Foster, Pearson Education.
6. Nanotechnology. The fun and easy way to explore the science of mater.s smallest Particles, Richard Booker and Earl Boysen, Wiley.
7. Nanotechnology: Content and Context, Christopher Kelty and Kristen Kulinowski.