



ACHARYA NAGARJUNA UNIVERSITY

4-year B.Tech. Degree Course
(Semester System)

**COMPUTER SCIENCE &
ENGINEERING**

SYLLABUS

W.E.F. 2015 – 2016
(from the batch admitted in the year 2015)

Acharya Nagarjuna University
Faculty of Engineering
Academic Regulations 2015 (R15) for B. Tech (Regular)

(Applicable for the students admitted during the
Academic Year 2015-2016 and onwards)

1. Eligibility for Admission:

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

- i. Admission shall be made either on the basis of merit/rank obtained by the qualifying candidates in EAMCET/ECET or otherwise specified, whichever is relevant.

The duration of B.Tech program is of four academic years divided into eight semesters comprising of two semesters in each academic year. A student is required to choose a branch of study at the time of admission. Students under lateral entry will be admitted straightaway into Third semester of B.Tech course in the respective branch. No change of branch shall be allowed after the admissions are closed.

2. Award of B.Tech. Degree:

A student will be declared eligible for the award of the B.Tech. degree if he/she fulfils the following academic regulations:

- i. Regular entry students shall pursue a course of study for not less than four academic years and in not more than eight academic years.

- ii. Student's who fail to fulfill all the academic requirements for the award of the degree within eight academic years (for Regular Entry) / six academic years (for Lateral Entry) from the year of their admission, shall forfeit their seat in B.Tech course and their admission is cancelled.

Completing the course of study shall mean not only satisfying the attendance requirements but also passing of all the subjects within the respective stipulated period

3. Branches of study:

The following Branches of study are offered at present for B. Tech. degree

S.No. Branch

1. Civil Engineering
2. Electrical and Electronics Engineering.
3. Mechanical Engineering.
4. Electronics and Communication Engineering
5. Computer Science and Engineering.
6. Chemical Engineering
7. Electronics & Instrument Engineering
8. Information Technology
9. BioTechnology

and any other branch as approved by the authorities of the University from time to time.

Each Branch will have a curriculum with a syllabi that shall consist of the following:

- i. General Core Courses
 1. Basic Sciences
 2. Engineering Sciences
 3. Humanities and social sciences
- ii. Program core courses in Engineering / Technology
- iii. Elective courses of Engineering / Technology / Management Entrepreneurship / Business Communication and allied fields.
- iv. Open Electives/CBCS
- v. Mandatory learning courses
- vi. Project work

4. Credits:

- i. *Academic Year*: Two consecutive (one odd + one even) semesters constitute one academic year.
- ii. *Choice Based Credit System (CBCS)*: The CBCS provides choice for students to select from the prescribed courses (core, elective or minor or soft skill courses).
- iii. *Credit*: A unit by which the course work is measured.

5. Distribution and Weightage of Marks (Internal & External):

- i. The performance of a student in each semester shall be evaluated subject-wise with a maximum of 100 marks for theory and 100 marks for practical subject. In addition internship & project work shall be evaluated for 100 and 200 marks respectively.
- ii. For theory subjects the distribution shall be 40 marks for Internal Evaluation and 60 marks for the External Evaluation.
- iii. There shall be four units in each of the theory subjects.
- iv. For theory subjects, there shall be two midterm examinations during the semester. Each midterm examination shall consist of assignment for 12 marks and sessional test for 18 marks with duration of 120 minutes respectively.

First midterm examination shall be conducted for 50% coverage of syllabus and second midterm examination shall be conducted for remaining 50% of syllabus. Both the midterm exams are compulsory. Final midterm examination marks for a total of 30 marks shall be arrived at, by considering the 80% weightage (24 marks) to that midterm examination in which the student scores more marks and the remaining 20% (6 marks) for other midterm exam.

***Note 1:** The assignment test paper shall contain 5 questions of equal weightage and student is asked to answer any 2 questions randomly and shall be condensed for 12 marks, any fraction rounded off to the next higher mark.

***Note 2:** The sessional examination shall contain 3 questions out of which first question is objective and compulsory and remaining two questions having internal choice and shall be considered for 18 marks, any fraction rounded off to the next higher mark.

***Note 3:** For the remaining 10 marks in internal evaluation, 5 marks allotted for attendance as indicated in CLAUSE(6) and the faculty members teaching the subject shall evaluate remaining 5 marks through quiz/online/objective examination at the end of semester.

V. For theory subjects, there will be 5 questions with following pattern in the End-Examination.

- a. All Questions have to be answered compulsorily.
- b. Question I shall contain 12 short Answer questions “a” to “l each of 1 mark. (Total 12 marks) covering one question from each unit.

- c. Out of the remaining four questions, EITHER/OR type shall be followed with 12 marks for each.
 - d. In each question as mentioned in (c), one, two or more bits can be set.
- vii. Further, whenever any theory subject with two parts is offered (combined subject), for ex:
- Electrical & Mechanical Technology, then there shall be only two parts Part A, Part B in the question paper.
 - First question objective can be equally divided into two parts.
 - Part – A: shall contain two questions, EITHER/OR type shall be followed with 12 marks for each.
 - Part – B: shall also contain two questions, EITHER/OR type shall be followed with 12 marks for each.
- viii. Model Question paper for each theory course shall be prepared by the teacher within 15 days from the commencement of the semester and the same shall be forwarded to the Controller of Examinations through the Chairman, BOS concerned.
- ix. For practical subjects there shall be a continuous evaluation during the semester for 40 internal marks and 60 end examination marks. Day-to-day work in the laboratory shall be evaluated for 25 marks by the concerned laboratory teacher based on the report of experiments/jobs(10 marks for the record submitted and 15 marks for day to day work). The end examination for 15 marks (10 marks for experiment and 5 marks for viva-voce) shall be conducted by the laboratory teacher and another examiner from the same department.
- *Note: Day to day performance shall be recorded in student record(each experiment carries 15 marks, at least ten experiments should be done and average marks must be taken at the end of semester).
- x. There shall be an audit pass (Mandatory learning Course) course in Human Values & Professional Ethics, Life skills and Advanced Communication Skills lab with no credits. There shall be no external examination. However, attendance in the audit course shall be considered while calculating aggregate attendance and student shall be declared pass in the audit course when he/she secures 40% or more in the internal examinations.
- xi. There shall be an Discipline centric Elective Course through Massive Open Online Course (MOOC) in III year II semester (For EEE, ECE and CSE branches) and in IV year I semester (For Civil, Mechanical and Chemical branches), where in the student shall register the course offered by authorized institutions/Agencies, through online with the approval of Head of the Department. The Certificate issued by the institution/agency after successful completion of the course will be considered for the award of grade to that course.
- xii. For the subject having design and / or drawing, such as Engineering Drawing, Machine Drawing and Estimation, the distribution shall be 40 marks for internal evaluation and 60 marks for end examination. The Internal evaluation will be 20 marks for day-to-day work in the class that shall be evaluated by the concerned subject teacher based on the reports/submissions prepared in the class. Further, there shall be two midterm exams in a Semester for a duration of 2 hrs each, evenly distributed over the syllabi for 20 marks and the average marks of both the mid examinations shall be considered as internal test marks. The sum of day to day evaluation and the internal test marks will be the final internal marks for the subject.

xiii. There shall be internship at the end of III year II Semester. For the internship, the student/institute shall select any organization and a minimum of 4 weeks work must be carried at the organization. A report on work done shall be evaluated by the external supervisor/mentor and department committee. The internship shall be evaluated for 100 marks (60 marks shall be awarded by external supervisor and 40 marks by departmental committee). There shall be no external examination for internship.

A student shall acquire 2 credits assigned to the internship only when he/she secures 40 marks on aggregate out of 100 marks allocated.

xiv. Out of a total of 200 marks for the project work, 80 marks shall be for Internal Evaluation and 120 marks for the End Semester Examination (Viva-voce). The viva-voce shall be conducted by a committee consisting of Head of the Department, Project Supervisor and an External Examiner nominated by the Principal from the panel of 3 members proposed by Head of the Department. The project work shall start in IV year I semester and shall continue in the semester break. The evaluation of project work shall be conducted at the end of the IV year II semester. The Internal Evaluation shall be made on the basis of weekly progress (a minimum of 12 weeks and 3 marks for each week progress) and at least two seminars (one at the beginning of IV B.Tech II semester (20 marks) and the other before submission of project work (24 marks) given by each student on the topic of his project.

xv. The laboratory records and internal test papers shall be preserved for minimum of 2 years in the respective departments and shall be produced to the Committees of the college as and when the same are asked for.

6. Attendance Requirements:

- i. A student shall be eligible to appear for end examinations if he/she acquires a minimum of 75% of attendance in aggregate of all the subjects in a semester.
- ii. Shortage of Attendance below 65% in aggregate shall in NO case be condoned.
- iii. Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee.
- iv. Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examination of that class and their registration shall stand cancelled.
- v. A student will not be promoted to the next semester unless he satisfies the attendance requirements of the present semester, as applicable. They may seek readmission for that semester when offered next.
- vi. A stipulated fee shall be payable towards condonation of shortage of attendance to the college.
- vii. A weightage in sessional marks upto a maximum of 5 marks out of 40 marks in each theory subject shall be given for those students who put in a minimum of 75% attendance in the respective subject in a graded manner as indicated below.

Attendance of 90% and above	5marks
Attendance of 85% and above and less than 90%	3marks
Attendance of 80% and above and less than 85%	2marks
Attendance of 75% and above and less than 80%	1mark

7. Minimum Academic Requirements (For Regular Entry Students):

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no.6

- i. A student who could not secure a minimum of 50% aggregate from midterm examination marks is not eligible to appear for the semester end examination and shall have to repeat that semester.

- ii. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, design, drawing subject or project if he secures not less than 40% of marks in the end examination and a minimum of 50% of marks in the sum total of the internal evaluation and end examination taken together. In the internship & project he/she should secure 40%. For practical examination if he secures not less than 50% of marks in the semester end examination.
- iii. A student shall be promoted from I to II year only if he/she fulfils the academic requirements of attendance and internal marks as stipulated in clause 6 and 7 irrespective of back log subjects in I/IV B.Tech.
- iv. A student shall be promoted from II to III year only if he/she fulfils the academic requirements of attendance and internal marks as stipulated in clause 6 and 7 and also must secure 70% of the credits of the subjects that have been studied up to I year II semester from
irrespective of whether the candidate takes the end examination or not as per the normal course of study. At the time of commencement of class work, he must attain the required credits
- v. A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of attendance and internal marks as stipulated in clause 6 and 7 and also must secure 70% of the credits of the subjects that have been studied upto II year II semester. At the time of commencement of class work, he must attain the required credits

And in case of getting detained for want of credits by sections ii and iii above, the student may make up the credits through supplementary exams of the above exams before the date of class work commencement of Third or Fourth year I semester respectively.

8. Minimum Academic Requirements (For Lateral Entry Students):

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no.6

- i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, practical, design, drawing subject or project if he secures not less than 40% of marks in the end examination and a minimum of 50% of marks in the sum total of the internal evaluation and end examination taken together. In the Seminar & Comprehensive viva-voce he/she should secure 40%.
- ii. A student who could not secure a minimum of 50% aggregate from midterm examination marks is not eligible to appear for the semester end examination and shall have to repeat that semester.
- iii. A student shall be promoted from II to III year only if he/she fulfils the academic requirements of attendance and internal marks as stipulated in clause 6 and 7 irrespective of back log subjects in II/IV B.Tech
- iv. A student shall be promoted from III to IV year only if he/she fulfils the academic requirement of attendance and internal marks as stipulated in clause 6 and 7 and also must secure **70%** of the subjects that have been studied up to III year I semester from

9. Grading:

After each subject is evaluated for 100 marks, the marks obtained in each subject will be converted to a corresponding letter grade as given below, depending on the range in which the marks obtained by the student fall.

Table – Conversion into Grades and Grade Points assigned

Range in which the marks in the subject fall	Grade	Grade points assigned
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≥ 90	O (Outstanding)	10
80-89	A+ (Excellent)	9
70-79	A (Very Good)	8
60-69	B+ (Good)	7
50-59	B (Above Average)	6
45-49	C (Average)	5
40-44	D (Pass)	4
< 40	F (Fail)	0
Absent	Ab (Absent)	0

- i. A student obtaining Grade F shall be considered failed and will be required to reappear for that subject when the next supplementary examination offered.
- ii. For non credit courses 'Satisfactory' or "Unsatisfactory' shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA.

9.1. Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

- i. The Semester Grade Point Average (SGPA) is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

$$SGPA = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where, C_i is the number of credits of the i^{th} subject and G_i is the grade point scored by the student in the i^{th} course.

- ii. The Cumulative Grade Point Average (CGPA) will be computed in the same manner taking into account all the courses undergone by a student over all the semesters of a program, i.e.

$$CGPA = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

Where 'S_i' is the SGPA of the i^{th} semester and C_i is the total number of credits in that semester.

- iii. Both SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.
- iv. While computing the GPA/CGPA the subjects in which the student is awarded Zero grade points will also be included.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

10. Gap - Year:

Gap Year – concept of Student Entrepreneur in Residence shall be introduced and outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time after I year/II year/III year to pursue entrepreneurship full time. This period may be extended to two years at the most and these two years would not be counted for the time for the maximum time for graduation. An evaluation committee shall be constituted to evaluate the proposal submitted by the student and the committee shall decide on permitting the student for having the Gap Year.

11. Transitory Regulations:(old regulations changed)

1. Candidates who admitted into the four year B.Tech degree course under R-15 regulations but who got detained in any year for want of attendance/minimum aggregate sessional marks may join the appropriate year /semester in the semester system applicable for that batch and be governed by the regulations of that batch from then onwards unless otherwise specified.
2. A student admitted under credit based regulations(CR) detained due to lack of sessional marks/attendance at the end of the first semester of II/IV B.Tech shall join II/IV first semester fo R-15 batch . Such students will study all the courses prescribed for that R-15 in which the student joins. However the student has to clear all the first year backlog subjects by appearing the supplementary examination. Such candidates will be governed by the regulations applicable to lateral entry candidates of R-15 batch for the award of the degree.
3. A student admitted under CR, detained due to lack of sessional marks/attendance at the end of the second semester of II/IV B.Tech /at the end of subsequent semesters shall follow the credit based regulations only (CR).

12. With–holding of results:

If the candidate has any dues not paid to the college or if any case of indiscipline or malpractice 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 awarding degree is liable to be withheld in such cases.

13. Award of Class:

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

Class Awarded	CGPA Secured
First Class with Distinction	≥ 8.0
First Class	$\geq 6.5 < 8.0$
Second Class	$\geq 5.5 < 6.5$
Pass Class	$\geq 4.0 < 5.5$

14. Minimum Instruction Days:

The minimum instruction period for a semester is 16 weeks. The minimum instruction days including exams for each semester shall be for 90 days.

15. There shall be no branch transfers after the completion of admission process.

16. General:

- i. The academic regulations should be read as a whole for purpose of any interpretation.
- ii. Malpractice rules - nature and punishments is appended
- iii. Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".
- iv. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the BOS is final.
- v. The University may from time to time, revise, amend or change the Regulations, Schemes of Examinations, and/or Syllabi.

17. Conduct and discipline

Students shall conduct themselves within and outside the premises of the institute in a manner befitting the students of our institution.

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

(c) The following acts of omission and / or commission shall constitute gross violation of the code of conduct and are liable to invoke disciplinary measures with regard to ragging.

(i) Lack of courtesy and decorum, indecent behavior anywhere within or outside the campus.

(ii) Willful damage of college / individual property

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

(iv) Mutilation or unauthorized possession of library books.

(v) Noisy and unseemly behavior, disturbing studies of fellow students.

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

(vii) Usage of camera / cell phone in the campus

(viii) Plagiarism of any nature

(ix) Any other acts of gross indiscipline as decided by the academic council from time to time.

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

(e) For an offence committed in (i) a hostel (ii) a department or in a class room and (iii) elsewhere, the chief warden, the head of the department and the principal respectively, shall have the authority to reprimand or impose fine.

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

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

(h) The institute level standing disciplinary action committee constituted by the academic council shall be the authority to investigate the details of the offence, and recommend disciplinary action based on the nature and extent of the offence committed.

(i) The principal shall deal with any academic problem, which is not covered under these rules and regulations, in consultation with the programmes committee in an appropriate manner, and subsequently such actions shall be placed before the academic council for ratification. Any emergency modification of regulation, approved by the appropriate authority, shall be reported to the academic council for ratification.

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

18. Punishments for Malpractice Cases - Guidelines

The examinations committee may take the following guidelines into consideration while dealing with the suspected cases of malpractice reported by the invigilators/squad members etc; during end examinations. The punishment may be more severe or less severe depending on the merits of the individual cases.

S. No	Nature of Malpractices/Improper conduct	Punishment
1.	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 student 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.
2.	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.
3.	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.
4.	Gives assistance or guidance or receives it from any other student orally or by any other body language methods or communicates through cell phones with any other student 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 students involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
5.	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 student is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects including practical examinations and project work of that semester/year.
6.	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 including practical examinations and project work of that semester/year.
7.	Smuggles in the Answer book or takes out or arranges to send out the question paper during the examination or answer book during or after the examination	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects including practical examinations and project work of that semester/year. The student is also debarred for two consecutive semesters from class work and all examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat.
8.	Refuses to obey the orders of the Chief	In case of students of the college, they

	<p>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 of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.</p>	<p>shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects of that semester/year. The students 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.</p>
9.	<p>Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.</p>	<p>Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects including practical examinations and project work 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.</p>
10.	<p>Possesses any lethal weapon or firearm in the examination hall.</p>	<p>Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects including practical examinations and project work of that semester/year. The student is also debarred and forfeits the seat.</p>

11.	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 7 to 9.	For Student of the college: Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects including practical examinations and project work 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.
12.	Impersonates any other student in connection with the examination	The student who has impersonated shall be expelled from examination hall. The student is debarred from writing the remaining exams, and rusticated from the college for one academic year during which period the student will not be permitted to write any exam. If the imposter is an outsider, he will be handed over to the police and a case is registered against him. The performance of the original student who has been impersonated, shall be cancelled in all the subjects of the examination including practicals and project work of that semester/year. The student is rusticated from the college for two consecutive years during which period the student will not be permitted to write any exam. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat
13.	If any malpractice is detected which is not covered in the above clauses 1 to 12 it shall be reported to the college academic council for further action to award suitable punishment.	
14.	Malpractice cases identified during sessional examinations will be reported to the examination committee nominated by Academic council to award suitable punishment.	

Acharya Nagarjuna University
Faculty of Engineering

B.TECH COURSE STRUCTURE

For Circuit Branches:CSE/ECE/EEE/IT/EIE
(2015-16)

I YEAR I Semester

Course Details		Scheme of Instruction			Scheme of Examination				
Code	Subject	L	T	P	Maxi Internal Marks	Maxi External Marks	Total Marks	Credits	Cat. code
BT/CSE/ECE/EEE-111	Mathematics –I	4	1	-	40	60	100	4	BSC
BT/CSE/ECE/EEE-112	Engineering Physics-1	3	-	-	40	60	100	3	BSC
BT/CSE/ECE/EEE-113	Engineering. Chemsitry-1	3	-	-	40	60	100	3	BSC
BT/CSE/ECE/EEE-114	Basic Mechanical Sciences	4	-	-	40	60	100	3	ESC
BT/CSE/ECE/EEE-115	Environmental science and Engineering	3	-	-	40	60	100	3	ESC
BT/CSE/ECE/EEE-116	Basic English for Engineers	4		-	40	60	100	4	HSC
BT/CSE/ECE/EEE-151	Physics Lab	-	-	3	40	60	100	2	BSC
BT/CSE/ECE/EEE-152	Engineering Graphics	-	-	6	40	60	100	2	ESC
BT/CSE/ECE/EEE-153	English Communication Lab	-	-	3	40	60	100	2	HSC
	Total	21	1	12	360	540	900	26	

I YEAR II Semester

Course Details		Scheme of Instruction			Scheme of Examination				
Code	Subject	L	T	P	Maxi Internal Marks	Maxi External Marks	Total	Credits	Cat. code
BT/CSE/ECE/EEE-121	Mathematics –II	4	1	-	40	60	100	4	HSC
BT/CSE/ECE/EEE-122	Engineering Physics-II	3	-	-	40	60	100	3	BSC
BT/CSE/ECE/EEE-123	Engineering Chemistry-II	3	-	-	40	60	100	3	BSC
BT/CSE/ECE/EEE-124	Basic Electrical & Electronic Sciences	3	1		40	60	100	3	BSC
BT/CSE/ECE/EEE-125	Problem solving using C	3	1	-	40	60	100	3	ESC
BT/CSE/ECE/EEE-126	Advanced English for Engineers	4	-	-	40	60	100	4	ESC
BT/CSE/ECE/EEE-161	Chemistry Lab	-	-	3	40	60	100	2	BSC
BT/CSE/ECE/EEE-162	Computer Programming Lab	-	-	6	40	60	100	2	ESC
BT/CSE/ECE/EEE-163	Workshop(IT)	-	-	3	40	60	100	2	ESC
	Total	20	3	12	360	540	900	26	

CSE/ECE/EEE– 111

4-1-0

MATHEMATICS – I

Unit-I

Matrices: Rank of a matrix, Consistency of linear system of equations, Linear transformations, vectors, Linear dependence, Eigen values and Eigen vectors, Properties of eigen values, Cayley-Hamilton theorem (without proof), Reduction to diagonal form, reduction of Quadratic form to canonical form, Complex matrices.

Unit-II

Rolle's Theorem(without proof), Lagrange's Mean value theorem (without proof), Taylor's theorem (without proof), Expansions of functions: Maclaurin's series, Taylor's series, Maxima and Minima of functions of two variables, Lagrange's method of undetermined multipliers, Principle of least squares, method of least squares, fitting of other curves.

Unit-III

Double integrals, Change of order of integration , Double integrals in polar coordinates, Area enclosed by plane curves, Triple integrals, Change of variables, Beta function, Gamma function, Relation between beta and gamma functions, error function.

Unit-IV

Fourier Series: Introduction and Euler's formulae, Conditions for a Fourier expansion, Functions having points of discontinuity, Change of interval, Even and Odd functions, Half range series, Typical wave forms and Parseval's formulae, Complex form of the Fourier series.

Text book

1]. Higher Engineering Mathematics by B.S. Grewal, 43rd edition, Khanna publishers, New Delhi.

Reference books:

- [1]. Advanced Engineering Mathematics by kreyszig.
- [2]. Engineering Mathematics by Babu Ram
- [3] Engineering Mathematics – I BY N.P. Bali, Satyanarayana Bhavanari and Indrani Kelker Laxmipublications, New Delhi.
- [4] Mathematical Foundations for Computer Sciences- by Satyanarayana Bhavanari, Pradeep Kumar T.V, Shaik Mohiddin shaw, BSP Publications.

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ENGINEERING PHYSICS - I

UNIT-I

Ultrasonics

12 Periods

Production of Ultrasonics by Piezo electric oscillator method, Detection by Acoustic grating method, Applications - Pulse echo technique, ultrasonic imaging and some general applications.

Interference

Stokes principle (Phase change on reflection), Interference in thin films due to reflected light (Cosine law), Newton's rings experiment – Determination of radius of curvature, Michelson's interferometer: Principle, construction working and its application (Determination of wavelength of monochromatic source).

UNIT-II

10 Periods

Diffraction – Single slit (Qualitative and quantitative treatment).

Polarisation – Polarisation by reflection, Refraction and double refraction in uniaxial crystals, Nicol prism, Quarter and half wave plate, circular and elliptical polarization and detection.

UNIT-III

14 Periods

Lasers: Laser characteristics, Spontaneous and Stimulated emissions, Basic requirements of a laser, Population inversion – Solid state laser (Ruby laser), Gas (He-Ne) laser, Semiconductor (GaAs) laser, Applications of lasers.

Holography: Principle, recording, reproduction and applications.

Fiber optics: Structure of optical fiber, Types of optical fibers, Numerical aperture, Fiber optics in communications and advantages.

UNIT -IV

14 Periods

Electricity and Magnetism

Gauss's law in electricity (statement & proof), Coulomb's law from Gauss law, Gauss law for magnetism, Faraday's law of electromagnetic induction, Lenz's law, Self Inductance, Mutual inductance, energy stored in a magnetic field, Displacement current, Maxwell's equations (qualitative treatment), electromagnetic wave equation and Velocity, A.C. circuit containing series LCR circuit (resonance condition).

TEXT BOOKS:

1. Engineering Physics - R .K. Gaur & S. L. Gupta , Danpati Rai Publications, Delhi, 2001.

2. Engineering Physics - Hitendra K. Malik & A.K.Singh, Tata MacGraw Hill, New Delhi,2009.

REFERENCE BOOKS:

1. Fundamentals of Physics - Resnick & Halliday, John Wiley sons ,9th Edition.
2. Applied Physics-S. Mani Naidu, Pearson Publishers, Chennai
3. Engineering Physics - M.Arumugam, Anuradha Publications, Chennai ,5thEdition , 2006.
4. Engineering Physics - B. K. Pandey & S. Chaturvedi, Cengage LearningIndia Pvt. Ltd., Delhi.
- 5.Engineering Physics, D.K. Bhattacharya and Poonam Tandon, oxford university Press, New Delhi

ENGINEERING CHEMISTRY – I

UNIT-I: WATER TECHNOLOGY

Various impurities of Water, WHO guidelines, Hardness units and determination by EDTA method (simple problems), water treatment for drinking purpose- sedimentation, coagulation, filtration (slow sand filter), various methods of chlorination, breakpoint chlorination.

Water treatment for industrial purpose: Boiler troubles, scales, sludges, caustic embrittlement, boiler corrosion, priming and foaming- causes and prevention, Internal conditioning -Phosphate, Calgon and carbonate treatment, External conditioning-Lime Soda process (simple problems), softening by ion exchange process, Desalination of brackish water by electro dialysis and reverse osmosis.

UNIT-II: ELECTROCHEMICAL ENERGY SYSTEMS

Primary and Secondary batteries, Reserve batteries, Solid state and molten solvent batteries, Recent technological trends, Lithium ion batteries, Nanostructured electrode materials, Lithium and carbon based nanomaterials and nanocomposites, Solid-state Lithium ion batteries, Energy storage and backup. Fuel cells, Scientific prospects of fuel cells, Electrochemistry, In-situ and ex-situ electrochemical characterizations, Current-Voltage measurement, Current Interrupt measurements, Porosity, BET surface area analysis, Gas permeability, Hydrogen as future fuel, Alkaline-, acid- and molten carbonate-fuel cells, Solid oxide fuel cells.

UNIT-III: CORROSION AND ITS PREVENTION

Introduction, electrochemical theory of corrosion, dry corrosion, corrosion due to differential aeration, Types of corrosion-galvanic corrosion (galvanic series), Pitting, Stress and microbiological corrosion, Factors affecting corrosion-oxidizers, pH, over voltage and temperature.

Protection methods: Cathodic protection, (Impressed current and sacrificial anode) anodic protection, corrosion inhibitors- types and mechanism of inhibition

UNIT-IV: POLYMERSS

Monomer functionality, degree of polymerization, Tacticity, classification of polymerization- addition, condensation and co-polymerization, mechanism of free radical polymerization.

Plastics- Thermoplastic and thermosetting resins, preparation, properties and uses of Bakelite, and PVC. Compounding of plastics.

Conducting polymers: Polyacetylene, mechanism of conduction, examples and applications.

Rubber- Processing of latex, Drawbacks of natural rubber- Vulcanization, Synthetic rubbers- Buna-S and Buna-N.

Prescribed Text Books

1. Engineering Chemistry, P.C. Jain and M. Jain - Dhanapathi Rai & Sons, Delhi
2. A text book of Engineering Chemistry, S.S. Dara - S. Chand & Co. New Delhi
3. Engineering Chemistry, B.K. Sharma - Krishna Prakashan, Meerut
4. Shashi chawla, A text book of engineering chemistry, 3rd Edition, Dhanpat rai & co new delhi, 2007.

Basic Mechanical Sciences**Unit – I****Transmission of Motion and Power**

Introduction, Methods of drive, Power transmission elements, shaft and axle, Belt-drive, Pulleys, Power transmitted by a belt, Chain drive, Friction drive, Gear drive

Governors

Introduction, Speed Control, Types of Governors, Watt Governor, Porter Governor, Hartnell Governor

Unit – II

Basic Thermodynamics: Work, Power, Energy, Heat, Temperature, Mechanical equivalent of heat, Internal energy, Enthalpy, Entropy, Efficiency, Statements of Zeroth law, First Law and Second Law of Thermodynamics

Internal Combustion Engines

Introduction, Classification, Engine details, Otto four-stroke cycle, Diesel-four-stroke cycle, Difference between Otto cycle and Diesel cycle, Two-stroke cycle, Difference between two-stroke and four-stroke cycles, Indicated Power (ip), Brake Power (bp), Efficiencies

Unit – III**Steam Boilers**

Introduction, Classification, Simple vertical boiler, Vertical multi tubular boiler, Cochran type, Lancashire boiler, Locomotive boiler, Babcock and Wilcox boiler, High pressure boilers, Boiler details, Boiler performance. Functioning of different mountings like Pressure gauge, Water level indicator, Safety Valve etc. and Accessories like Feed Pump, Injector, Economizer, Steam trap etc.

Refrigeration & Air Conditioning

Introduction, Refrigerant, Types of refrigerators, Vapor compression refrigerating system, Window and split-air conditioners.

Unit – IV**Pumps**

Introduction, Reciprocating pump types, operation, Air Chamber, Centrifugal pumps types, Priming, Rotary pumps.

Air Compressors

Introduction, Uses of Compressed air, Reciprocating compressors, Operation of a compressor, Work for compression, Power required, Reciprocating compressor efficiency, Multistage reciprocating compressors, Rotary compressors.

TEXT BOOKS

1. Elements of Mechanical Engineering , by Rajput ,Laxmi Publications, New Delhi
2. Elements of Mechanical Engineering by K.P. Roy , Media Promoters
3. Thermal Engineering – by Rajput, Laxmi Publications, New Delhi
4. Theory of Machines , by R.S. Khurmi & Gupta, S.Chand Publishers
5. Elements of Mechanical Engineering -- by K.P. Roy , Media Promoters

ENVIRONMENTAL SCIENCE AND ENGINEERING**UNIT-I**

Introduction:

Definition, Scope and Importance.

Natural Resources:

Forest Resources – Use and over-exploitation, Deforestation, Mining, dams and their effects on forests and tribal people; Water Resources – Use and over-utilization of surface and ground water, floods and droughts, Water logging and salinity, Dams – benefits and problems, Conflicts over water; Energy resources – Energy needs, Renewable and non-renewable energy sources; Land resources – Land as a resource, land degradation, soil erosion & desertification, Effects of modern agriculture on land resources.

Ecosystems:

Definition, Structure and functions of an Ecosystems, Biogeochemical cycles-water, carbon, nitrogen and water cycles, Types-Forest, Greenland, Desert, Aquatic ecosystem.

UNIT-II**Biodiversity and its Conservation:**

Definition, Value of biodiversity. Bio-geographical classification of India, India as a mega-diversity nation, Hot-spots of biodiversity, Threats to bio-diversity, Endemic and endangered species of India, Conservation of biodiversity.

Environmental Pollution:

Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, nuclear pollution, Solid waste management.

UNIT-III**Social Issues and Environment:**

From unsustainable to sustainable development, Population growth and environment, Green revolution, Rain water harvesting, watershed management, cloud seeding, Resettlement and rehabilitation of people - problems and concerns, Environmental Impact Assessment.

Climate Changes:

Global warming & Green house effect, Acid rain, Ozone layer depletion.

UNIT-IV**Environmental acts:**

Prevention and Control of Water pollution & Air Pollution act, Environmental protection act, Wildlife protection act, Forest Conservation act.

International Conventions:

Stockholm Conference 1972, Earth Summit 1992. Copenhagen Summit 2009.

Case Studies:

Chipko movement, Narmada Bachao Andolan, Silent Valley Project, Madhura Refinery and TajMahal, Chernobyl Nuclear Disaster, Ralegaon Siddhi, Florosis and Bhopal Tragedy.

Field work:

Visit to a local area to document environmental assets – river/ forest/ grassland / hill /mountain. Study of local environment-common plants, insects, birds. Study of simple ecosystems – pond, river, hill, slopes etc. Visits to industries, water treatment plants, effluent treatment plants.

Text Books

1. Environmental Studies, by Dr. Suresh K. Dhameja, Published by S.K. Kataria & Sons, Ludhiana.

Reference Books

1. Environmental studies by Anubha Kaushik and C.P.Kaushik., New Age International Publishers, New Delhi.
2. T Benny Joseph, Environmental Studies, the Tata McGraw-Hill Publishing Company Limited, New Delhi.
- 3.Environmental chemistry by A.K.De.

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Basic English for Engineers

UNIT-1:

1. Listening Skills: The boy who broke the bank (English and Soft Skills)
2. Sonnet - To Science (The Siren's Song)
3. Vocabulary Building: One-Word Substitutes, Words Often Confused
4. Reading Comprehension

UNIT- II:

1. Written Communication Skills: Gateman's Gift (English and Soft Skills)
2. Work without Hope (The Siren's Song)
3. Grammar: Correction of Sentences
4. Writing: Letter Writing-- Formal and Informal Letters

UNIT - III:

1. Assertive Skills: The Verger (English and Soft Skills)
2. Seven Ages of Man (The Siren's Song)
3. Writing: Note- Taking, Note-Making
4. Paragraph Writing: Technical Description-Process, Object

UNIT - IV:

1. Teamwork Skills: Whitewashing the fence (English and Soft Skills)
2. Ozymandias (The Siren's Song)
3. Vocabulary Building: Idioms
4. Writing: Essay Writing

TEXTBOOKS:

1. S.P.Dhanavel, *English and Soft Skills*, New Delhi: Orient Black Swan Pvt. Ltd., 2013.
2. David Murdoch, *The Siren's Song: An Anthology of British and American Verse*, Madras, Orient Longman, 1993.
3. V.R.Narayanaswami, *Strengthen Writing 3rd Edition* New Delhi: Orient Blackswan Private Ltd., 2009.

REFERENCE BOOKS:

1. Dr. Shalini Verma, *Word Power Made Handy*, S.Chand & Co Ltd., 2009.
2. Sharon J.Gerson, Steven M.Gerson, *Technical Writing*, New Delhi: Pearson education, 2007.
3. Sanjay Kumar and Pushp Lata, *Communication Skills*, Noida: Oxford University Press, 2012.
4. M. Ashraf Rizvi, *Effective Technical Communication*, New Delhi: Tata Mc-Grew Hill, 2009.
5. Bikram K. Das, Kalyani Samantray, Rath Nayak, Susmita Pani & Saveeta Mohanty, *An Introduction to Professional English and Soft Skills*, New Delhi: Foundation Books, 2009.

Any 15 experiments from the following list

LIST OF EXPERIMENTS

1. Compound pendulum –Determination of acceleration due to gravity (g)
2. Interference fringes - measurement of thickness of a foil / diameter of Wire using wedge method.
3. Sensitive galvanometer - Determination of figure of merit
4. Newton's rings – Measurement of radius of curvature of plano convex lens
5. Lissajous' figures –Calibration of an audio oscillator
6. Photo cell – I-V Characteristic curves and determination of stopping potential
7. Diffraction grating – Measurement of wavelengths
8. Torsional pendulum- Determination of rigidity modulus of the wire material.
9. Carey- Foster's bridge: Determination of specific resistance/Temperature coefficient of resistance.
10. Photo voltaic cell - Determination of fill-factor
11. Variation of magnetic field along the axis of a current carrying circular coil.
12. Series LCR resonance circuit - Determination of "Q" factor.
13. Thomson's method - determination of e/m of an electron.
14. Determination of a.c. Frequency – Sonometer.
15. Prism/Grating - Determination of dispersive power.
16. To determine the wavelength of Laser source.
17. Hall effect – Determination of Hall coefficient.
18. Determination of energy band gap.
19. Determination of Numerical Aperture of an optical fiber.
20. Determination of Amplitude and Frequency of an AC signal using a CRO.

Engineering Graphics**Unit – I**

General: Use of Drawing instruments, Lettering .-Single stroke letters, Dimensioning- Representation of various type lines. Geometrical Constructions..Representative fraction, Scales.-Plain Scales, Diagonal Scales, Comparative Scales, Vernier Scales.

Unit – II

Curves : Curves used in Engineering practice - conic sections - general construction and special methods for ellipse, parabola and hyperbola. cycloid, epicycloids, hypocycloid involute of circle and Archemedian Spiral.

Unit – III

Method of Projections: Principles of projection - First angle and third angle projection of Points. Projection of Straight lines. Traces of lines. (Limited to first angle projection only)

Projections of Planes : Projections of planes, projections on auxiliary planes.

Unit – IV

Projections of Solids : Projections of Cubes, Prisms, Pyramids, Cylinders and Cones with varying positions.

Sections Of Solids: Sections of Cubes, Prisms, Pyramids, cylinders and Cones, true shapes of sections. (Limited to the Section Planes perpendicular to one of the Principal Planes).

Unit - V(Demonstration only).

Computer Aided Drafting (using any Standard Package): Setting up a drawing, starting main menu (New, Open Save, Save As etc), Opening Screen error correction on screen units, co-ordinate system, limits, grid, snap, ortho.

Tool bars: Draw tool bar, object snap, tool bar, modify tool bar, dimension tool bar

TEXT BOOK:

- Engineering Drawing by N.D. Bhatt & V.M. Panchal. (Charotar Publishing House,Anand).

REFERENCE BOOK:

- Engineering Drawing by Prof.K.L.Narayana & Prof. R.K.Kannaiah. SciTech Publisher.

English Communication Lab

Module-I Communication Skills

- Types of Communication
- Barriers to Communication
- Strategies for Effective Communication

- d) Verbal Communication Skills
- e) Non- verbal Communication Skills

Module-2: Advanced Vocabulary

- a) Word List (GRE & TOEFL related)
- b) Catchphrases
- c) Idioms

Module-3: Employability Skills

- a) Interview Skills
- b) Group Discussion
- c) Debate
- d) Resume Writing

Module-4: Telephonic Skills

- a) Formal & Informal interaction
- b) Receiving Messages & Complaints
- c) Tone modulation

Module-5: Descriptive Skills

- a) Process Description
- b) Picture Description
- c) Narration
- d) Email Etiquette

Module-6: Behavioural Skills

- a) Dress code & Conduct
- b) Personality Development
- c) Team Work
- d) Motivation
- e) Organization Skills

Suggested Software:

1. Globerena Software
2. K-Van Solutions Software
3. Centronix Software
4. Clarity English Software
5. Train 2 Success- CD Series (Zenith Global Consultancy)

Suggested List of Tasks:

Module 1	<ol style="list-style-type: none"> 1. Tips for effective communication 2. Videos can be shown to make the students learn the importance of
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	non-verbal communication
Module 2	3. Number of Worksheets will be given on Vocabulary enhancement 4. By conducting Quiz
Module 3	5. Mock Interviews can be conducted 6. Peer Discussions can be conducted
Module 4	7. Listening to Mock-Telephoning Skills 8. Role Plays can be conducted on telephonic conversations
Module 5	9. Pictorial descriptions 10. Narrating situations/stories
Module 6	11. Tips to improve personality development 12. Case studies on team work and organizational skills

NOTE: 10 Lab Activities are minimum in Record.

Reference Books: Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

1. *Communicate to Conquer: A Handbook of Group Discussions and Job Interviews* with CD, PHI Publications.
2. *The ACE of Soft Skills: Attitude, communication and Etiquette for Success*, by Pearson Publications.
3. Leena Sen, *Communication Skills 2nd Edition*, PHI, 2007.
4. Stephen P. Robbins and Timothy A. Judge, *Organizational Behavior 13th Edition*, PHI, 2009.
5. Meenakshi Raman and Prakash Singh, *Business Communication*, Oxford University Press, 2006.
6. Sanjay Kumar and Pushp Lata, *Communication Skills*, Oxford University Press, 2011.
7. Dr. Shalini Verma, *Word Power Made Handy*, S.Chand & Co Ltd., 2009.

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Mathematics-II

Unit-I

Ordinary differential equations (first order): Introduction, variables separable equations, Linear equations, Bernoulli's equations, Exact equations, equations reducible to exact equations, Orthogonal trajectories, Newton's law of cooling, Rate of Decay of Radio-Active Materials.

Unit-II

Ordinary differential equations (higher order): Linear Differential equations: Definition, Theorem, Operator D, Rules for finding the complementary function, Inverse operator, Rules for finding the particular integral, Working procedure to solve the equation, Linear dependence of solutions, Method of variation of parameters, Equations reducible to linear equations, Cauchy's homogeneous linear equation, Legendre's linear equation, Simultaneous linear equations with constant coefficients.

Unit-III

Laplace Transforms : Introduction, Transforms of elementary functions, Properties of Laplace Transforms, existence conditions, Transforms of derivatives, Integrals, multiplication by t^n , division by t , Evaluation of integrals by Laplace Transforms, Inverse transforms, convolution theorem, Application to Differential equations with constant coefficients, transforms of unit step function, unit impulse function, periodic function.

Unit-IV

Vector Calculus: Scalar and vector point functions, Del applied to scalar point functions. Gradient, Del applied to vector point functions, Physical interpretation of divergence, Del applied twice to point functions, Del applied to products of point functions, Integration of vectors, Line integral, Surfaces, Green's theorem in the plane (without proof), Stoke's theorem (without proof), Volume integral, Gauss divergence Theorem (without proof),.

Text book

- 1]. Higher Engineering Mathematics by B.S. Grewal, 43rd edition, Khanna publishers, New Delhi.

Reference books:

- [1]. Advanced Engineering Mathematics by kreyszig.
- [2]. Engineering Mathematics by Babu Ram.
- [3] Engineering Mathematics – I BY N.P. Bali, Satyanarayana Bhavanari and Indrani Kelker Laxmipublications, New Delhi.
- [4] Mathematical Foundations for Computer Sciences- by Satyanarayana Bhavanari, Pradeep Kumar T.V, Shaik Mohiddin shaw, BSP Publications

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Engineering Physics-II

Unit-I

12 Periods

Principles of Quantum Mechanics

Dual nature of light, Matter waves & properties, de Broglie's concept of matter waves, Davisson and Germer experiment, Heisenberg's uncertainty principle and applications (non-existence of electron in nucleus). One dimensional time independent Schrodinger's wave equation, Physical significance of the wave function, Particle in a box (one dimensional).

Unit-II

12 Periods

ELECTRON THEORY OF METALS: Classical free electron theory - Mean free path - Relaxation time and drift velocity - Quantum free electron theory - Fermi - Dirac (analytical) and its dependence on temperature - Fermi energy, Hall effect and its uses.

BAND THEORY OF SOLIDS: Bloch theorem (qualitative) - Kronig - Penney model - Origin of energy band formation in solids - Classification of materials into conductors, semi- conductors & insulators -Concept of effective mass of an electron.

Unit-III

12 Periods

Dielectric and Magnetic Materials

Electric dipole moment, polarization, dielectric constant, polarizability, types of polarizations, internal fields (qualitative), Clausius-Mossotti equation, Frequency dependence of polarization, Ferroelectrics and their applications.

Origin of magnetic moment of an atom, Bohr magneton, classification of dia, para and ferro magnetic materials on the basis of magnetic moment, Hysteresis curve, soft and hard magnetic materials, Ferrites and their applications.

UNIT –IV

Advanced Materials of Physics**14 Periods**

Optoelectronic devices: Qualitative treatments of Photo diode, LED and LCD; Solar cell and its characteristics.

Superconductivity: First experiment, critical parameters (T_c , H_c , I_c), Meissner effect, types of superconductors, BCS Theory (in brief) and Applications of superconductors.

NanoTechnology : Introduction to nano materials, nano scale, surface to volume ratio, fabrication of nanomaterials, sol-gel and chemical vapour deposition methods, Carbon nano tubes-preparation and properties (thermal, electrical and mechanical - in brief), some applications of nanomaterials.

TEXT BOOKS

1. Engineering Physics - R .K. Gaur & S. L. Gupta , Danpati Rai Publications, Delhi, 2001.
2. Engineering Physics – V. Rajendran, Tata MacGraw Hill, New Delhi, 2009.

REFERENCE BOOKS

1. Engineering Physics-P.K. Palanisamy, Scitech Publications PVT. Ltd, New Delhi
2. Engineering Physics – M.R. Srinivasan, New age International Publishers, New Delhi
3. Materials science – M.Vijaya and G.Rangarajan, TMH, New Delhi
4. Engineering Physics, D.K. Bhattacharya and Poonam Tandon, Oxford university Press, New Delhi

ENGINEERING CHEMISTRY -II**UNIT-I: CHEMISTRY OF NANOMATERIALS**

Introduction to nano chemistry, preparation of nano materials - carbon nanotubes and fullerenes and their engineering applications.

UNIT-II: INSTRUMENTAL METHODS OF ANALYSIS

Basic principles, instrumentation and applications of UV-Visible, Infra-Red, Nuclear Magnetic Resonance (NMR), Gas Chromatography and High Performance Liquid Chromatography.

UNIT-III: SOLID STATE CHEMISTRY

Band theory of solids, types of semiconductors, preparation of semiconductors and semiconductor devices.

UNIT-IV: SOLAR ENERGY HARNESSING

Fundamentals, Conversion into electrical energy, Photovoltaic and Photogalvanic energy storage, Semiconductor photoelectrochemical cells, Photoelectrochemical reactions, Regenerative photoelectrochemical cells, Basic problems, Photocorrosion and protection of semiconductor electrodes, Protective coatings, Coatings of metals and electrically conductive polymers, Electrodes with chemically modified surfaces.

Prescribed Text Books

1. Engineering Chemistry, P.C. Jain and M. Jain – Dhanapath Rai & Sons, Delhi
2. Text book of Nano Science and Nano technology, B.S. Murthy and P. Shankar, University press.
3. Text book of engineering chemistry, Shasi chawla, Dhanapath rai & sons, Delhi.
4. Gurudeep raj & chatwal anand , “Instrumental methods of analysis “, 7th edition, CBS publications, 1986.
5. Quantitative analysis by day&underwood.
6. A Text book of Instrumental methods by Skoog and West.
7. H.W. Wilard and demerit, “Instrumental methods of analysis “, 7th edition, CBS publications, 1986.

Basic Electrical and Electronic Sciences

UNIT – I

Basic concept components and Electrical Circuits: The unit of charge, voltage, current, power and energy. Circuit elements, circuit concept, Kirchhoff's voltage law and Kirchhoff's current law applied to simple series and parallel circuits.

Alternating currents: Definition of Peak value, RMS value, Average value, Peak factor and Form factor of Alternate current, Behaviour of Resistance, Inductance and Capacitance to Sinusoidal voltage.

Vector and J-notation as applied to the resolution of AC circuit, Vector diagrams, Single-phase series, and Parallel and Series-parallel circuits to sinusoidal excitation. Calculation of Active, Reactive and Complex power and Power factor.

UNIT-II

Polyphase circuits: 3-phase supply, star-delta connections, Voltage, Current and Power relationships.

Electromagnetic Induction: Introduction – Electromagnetic Induction – Faraday's Laws of Electromagnetic Induction –Direction of Induced EMF and current – Induced EMF – Dynamically induced EMF –Statically induced EMF – Self Inductance – Mutual Inductance - Coefficient of coupling –Inductances in Series – Inductances in parallel – Energy stored in a magnetic field.

Measuring Instruments: Classification of instruments, construction and Principle of operation of permanent magnetic moving coil, moving iron dynamo meter type wattmeter Induction Type Energy Meter. Principle of operation of DVMs and CROs.

UNIT - III

Semiconductor Diodes: Characteristics of Semiconductor junction Diode, Zener diode transistor, JFET, UJT, SCR and their applications. Half-wave, full-wave rectifiers and Bridge rectifier, with (L and LC) and without filters, Zener Voltage Regulator and their applications.

Bipolar Junction Transistor: Transistor operation, Common base configuration, Common emitter configuration, Transistor amplifying action, Common collector configuration, Operating point, Principal and characteristics of JFET.

UNIT - IV

AMPLIFIERS: Need of biasing, Thermal runaway, Types of biasing-fixed bias, collectorbase bias, self bias, CE amplifier, frequency resoponse.

Feedback and Oscillator Circuits: Feedback concepts, feedback connection types, Barkhausen criteria, Phase-Shift oscillator, Wien bridge oscillator, Hartley oscillator, Colpitts oscillator.

LEARNING RESOURCES

TEXT BOOKS:

1. A.Sudhakar and Shyam Mohan SP, Circuits and Networks: Analysis and Synthesis, 3rd Edition, TMH, 2006.
2. Robert Boylestad, Louis Nashelsky, "Electronic Devices and Circuit Theory", 6th Edition, PHI.

REFERENCE BOOKS:

1. Mahmood Nahvi and Joseph Edminister, Electric Circuits, 4th Edition, Schaum's outline series, TMH, 2004.
2. Electrical Technology, B.L.Theraja & A.K.Theraja, Volume – I & II
3. S.Salivahanan, A.Vallavaraj, "Electronic Devices and Circuits", Tata McGraw Hill Publishers
4. N.N.Bhargava & D.C.Kulshreshtha, "Basic Electronics", Tata McGrawHill Publishers

Problem Solving using C**UNIT-1 (16 Periods)**

Computer Basics: The Computer System, Generations of Computer, Classification of Computer, Block diagram of digital Computer, Inside the Computer-Processor, Memory, External Ports, PCI Card, Formatting Hard disk, Understanding BIOS, BIOS Commands, Algorithm, Flowchart, Programming Paradigms.

C-Basics: C-character set, Data types, Constants, Expressions, Structure of C program, Operators and their precedence & associativity, Simple programs in C using all the operators, Type casting, type coercion.

UNIT-II (16 Periods)

Control Structures, Basic input and output statements, Preprocessor directives. Functions: Concept of a function, passing the parameters, automatic variables, scope and extent of variables, storage classes, recursion, iteration vs recursion, types of recursion, Simple recursive and non recursive programs, Towers of Hanoi problem.

UNIT-III (16 Periods)

Arrays: Single and multidimensional Arrays, Character array as a string, string functions, Programs using arrays and string manipulation.

Pointers: Pointers declarations, Pointer expressions, Pointer parameters to functions. Pointers, Pointers and array, Pointer arithmetic.

UNIT-IV (16 Periods)

Structures: Declaring and using structures, operations on structures, structures and arrays, user defined data types, pointers to structures. Command line arguments.

Files: Introduction, file structure, file handling functions, file types, file error handling, Programs using file functions.

Text Books:

1. Programming with C-Gottfried-Schaums Outline Series-TMH
2. C Programming – Anitha Goel/Ajay Mittal/E.Sreenivasa Reddy-Pearson India

References :

1. Problem Solving with C- Somasekharan-PHI.
2. C Programming- Behrouz A forouzan – CENGAGE Learning
2. Test your c skills-Yaswanth kanithker
3. Let us C- Yaswanth kanithker

Advanced English for Engineers**UNIT-1:**

1. Learning Skills: Three Questions (English and Soft Skills)
2. The Human Seasons (The Siren's Song)
3. Vocabulary Building: Root Words (100)
4. Writing: Data Interpretation (IELTS Model)

UNIT- II:

1. Problem - Solving Skills: (English and Soft Skills)
2. On His having arrived at the Age of Twenty Three (The Siren's Song)
3. Grammar: Text Completion (GRE Model)
4. Writing; Technical Reports (Factual Reports, Feasibility Reports, Survey Reports)

UNIT - III:

1. Interview Skills: The lighthouse keeper of Aspinwall (English and Soft Skills)
2. Youth and Age (The Siren's Song)
3. Grammar: Sentence Equivalence (GRE Model)
4. Analytical Writing: **Analyzing an Issue, Analyzing an Argument** (GRE Model)

UNIT - IV:

1. Adaptability Skills: Senior Payroll (English and Soft Skills)
2. The Marriage of True Minds (The Siren's Song)
3. Vocabulary Building: Foreign Expressions (100)
4. Writing: Office Correspondences (Memos, Circulars, Notice, Agenda of a meeting)

TEXTBOOKS:

1. S.P.Dhanavel, *English and Soft Skills*, New Delhi: Orient Black Swan Pvt. Ltd., 2013.
2. David Murdoch, *The Siren's Song: An Anthology of British and American Verse*, New Delhi: Orient Longman, 2012.

REFERENCE BOOKS:

1. B. Theodore, *Easy Way to Learn Difficult Words: The Unique English Etymology Dictionary*, Theos Publications, 2011.
2. Gill, Japinder. *Vocabulary Advantage*, Pearson Publication, 2012.
3. Philip G., *Pearsons Essential Words for GRE*, New Delhi : New Age International Publishers, 2012.
4. V.R.Narayanaswami, *Strengthen Writing 3rd Edition* New Delhi: Orient Blackswan Private Ltd., 2009.
5. Sharma C. *Business Correspondence & Report Writing*, Tata Mc Graw –Hill, 2002.
6. Kirkman, John . *Good Style: Writing for Science & Technology*, Routledge Study Guides,
7. Alec Fisher, *Critical Thinking An Introduction*, New Delhi: CUP, First South Asian Edition, 2011.

ENGINEERING CHEMISTRY LABORATORY**LIST OF EXPERIMENTS:**

1. **Determination of purity of washing soda**
2. **Determination of alkalinity of water**
3. **Determination of iron from Mohr's salt by permanganometry**
4. **Determination of iron from hematite by dichrometry**
5. **Determination of copper from brass by iodometry**

6. Determination of available chlorine in bleaching powder.
7. Determination of hardness of water by EDTA method
8. Determination of tin and lead from solder by complex metric titrations
9. Determination of chloride by precipitation titration method
10. Determination of calcium by semi gravimetric method
11. Preparation of phenol-formaldehyde resin
12. Chemistry of blue printing

DEMONSTRATION:

13. Acid-Base titration by pH meter, conductivity meter and potentiometer
14. Determination of viscosity of viscosity of lubricating oil.

CE/CSE/ECE 162

2-0-6

Computer Programming Lab

CYCLE-I Basics of Hardware and Software Exercises:

1. Explore Mother Board components and Layouts, identifying external ports and interfacing, identifying PCI cards and interfacing.
2. Practice partitioning and formatting Hard disks.
3. Install and Uninstall system and application software.
4. Understand BIOS configuration.
5. Connect 2 or more computers in a LAN network.
6. Assembling a Computer and troubleshooting a Computer.
7. Study and practice of operating system commands
 - a. Study and practice of directory Related Utilities.

- b. Study and practice of file and Text Processing Utilities.
- c. Study and practice of disk, Compress and Backup Utilities.
- d. Study and practice of Networking Utilities

CYCLE-II Programming Exercises:

1.Exercises on data types and operators?

- a) Practice exercises 3.1 to 3.16 and 4.1 to 4.17 and 14.1 to 14.20 Test your C Skills - yaswanth kanitkar text book.
- b) Write a program which determines the largest and the smallest number that can be stored in different data types of like short, int., long, float and double. What happens when you add 1 to the largest possible integer number that can be stored?
- c) Write a program to find greatest of three numbers using conditional operator?
- d) Write a program to swap two numbers with and without temp variable?
- e) Practice a program using multiple unary increment and decrement operators in arithmetic expressions?

2. Exercises on control structures?

- a) Practice exercise 2.1 to 2.15 Test your C Skills - yaswanth kanitkar text book.
- b) Write a program to find greatest of three numbers? Use nested if, if else if and switch statements?
- c) Write a program to read marks of a student and print the sum and average? Display the grade based on the sum of marks?
- e) write a program to count the digits of a number? Use for loop
- f) Write a program to check whether a number is perfect or not? Use do-while
- g) Write a program to check whether a number is strong or not? Use while
- h) Write a program to check whether a number is armstrong or not? Use for
- i) Write a program to check whether a number is palindrome or not? Use for
- j) Write a program to find the Fibonacci series upto the given number? Use while
- k) Write a program to print the pascals triangle? Used do-while
- l) Write a program to print the result of the series $1+x^2/2+x^3/3+\dots+x^n/n$

3. Exercises on functions?

- a) Practice exercise 5.1 to 5.14 Test your C skills -yaswanth kanitkar text book.
- b) Write program to swap two variables using functions?
Write a program to perform menu driven arithmetic operations using functions?
- c) Write a program to find the factorial of a number using recursive and non- recursive functions?
- d) Write a program to find the Fibonacci series using recursive functions?
- e) Write a program to find the solution for towers of Hanoi using recursive function?
- f) Write a program to pass parameters to a functions using call by value and call by reference?

4. Exercises on Arrays?

- a) Practice exercise 9.1 to 9.17 Test your C skills - yaswanth kanitkar text book.
- b) Write a program to read n numbers and sort them?
- c) Write a program to find the minimum and maximum numbers of the array?
- d) Write a program to read two matrices and find their sum, difference and product of them?
- e) Find the transpose of a matrix?
- f) Write a program to print upper and lower triangle of a given matrix?

5. Exercises on strings?

- a) Practice exercise 10.1 to 10.15 yaswanth kanitkar text book.
- b) Write a program to demonstrate the use of string manipulation functions?
- c) Write a program to compare two strings?
- d) Write a program to sort the names in Alphabetical order?

6. Exercises on pointers?

- a) Practice exercise 7.1 to 8.26 yaswanth kanitkar text book.
- b) Write a program to read dynamic array and sort the elements?
- c) Write a program to read dynamic array and find the minimum and maximum of the elements?
- d) Write a program to perform pointer arithmetic?
- e) Write a program on pointers for strings?
- f) Write a program to use array of pointers?

7. Exercises on structures?

- a) Practice exercise 11.1 to 11.30 yaswanth kanitkar text book.
- b) Write a program to create student structure and read marks of three subjects and find the sum and total of the student?
- c) Write a program on arrays of structures for 60 students record using the above student structure?
- d) Write a program for complex structure? Perform addition, subtraction and multiplication of two complex numbers?
- e) Write a program for addition and multiplication of two polynomials?

8. Write a program on Files?

- a) Practice exercise 12.1 to 12.20 yaswanth kanitkar text book.
- b) write a program to append content of a file?
- c) Write a program to display the content of a file?
- d) Write a program to copy content of one file to other file?
- e) Write a program to count the no of characters in a file?
- f) Write a program to compare the contents of two files?

References:

- 1. Test your C Skills by – Yaswanth Kanithkar-BPB Publishers
- 2. C programming; Test your skills-A.N.Kamthane-Pearson India

CSE/ECE/EEE– 163

0-0-4

Workshop(IT) LIST OF EXPERIMENTS

PC Hardware

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.

Task 2 :

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

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.

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

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

Task 6 : Software Troubleshooting :

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

Internet & World Wide Web

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

Task 2 : Web Browsers, Surfing the Web :

Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plugins like Macromedia Flash and JRE for applets should be configured

Task 3

Search Engines & Netiquette :

Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Task 4:

Cyber Hygiene:

Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install antivirus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

Task 5:

Develop your home page using HTML Consisting of your photo, name, address and education details as a table and your skill set as a list.

Productivity tools LaTeX and Word

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 three 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.

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.

Task 2:

Creating project abstract Features to be covered: Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task 3 :

Creating a Newsletter : Features to be covered: Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

EXCEL-

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 two 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

Task 2 : Calculating GPA -.Features to be covered:-

Cell Referencing, Formulae in excel –average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP,Sorting,

Conditional formatting LaTeX and MS/equivalent (FOSS) tool

Power Point

Task1:

Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :-

PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting

Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Power

point. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

Task 2:

Second week helps students in making their presentations interactive. Topic covered during this week includes: Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Chart.

Task 3:

Concentrating on the in and out of Microsoft power point and presentations in LaTeX. Helps them learn best practices in designing and preparing power point presentation. Topic covered during this week includes: -

Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting –Back ground, textures, Design Templates, Hidden slides.

REFERENCE BOOKS:

1. Introduction to Information Technology, IITL Education Solutions limited, Pearson Education.
2. LaTeX Companion Leslie Lamport, PHI/Pearson.
3. Introduction to Computers, Peter Norton, 6/e Mc Graw Hill Publishers.
4. Upgrading and Repairing, PC's 18, Scott Muller QUE, Pearson Education
5. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech
6. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme. CISCO Press, Pearson Education.
7. PC Hardware and A+Handbook Kate J. Chase PHI (Microsoft)

**II / IV B.Tech., (COMPUTER SCIENCE & ENGINEERING)
(SEMESTER – III)**

II YEAR I SEMESTER

Course details		Scheme of Instruction				Scheme of Examination			
Code	Subject	L	T	P	C	Maxi Internal Marks	Maxi External Marks	Total Marks	Cat. code
CSE/IT 211	Mathematics III	4	-	0	4	40	60	100	HSC
CSE/IT 212	Digital Logic Design	4	1	0	4	40	60	100	ESC
CSE/IT 213	Operating Systems	4	1	0	4	40	60	100	ESC
CSE/IT 214	Discrete Mathematical Structures	4	0	0	4	40	60	100	ESC
CSE/IT 215	Data Structures using C	4	1	0	4	40	60	100	ESC
CSE/IT 216	Human Values & Professional Ethics/Life Skills(Audit)	2	0	0	0	40	60	100	HSC
CSE/IT 251	Data Structures Lab	0	0	4	2	40	60	100	ESC
CSE/IT 252	DLD LAB	0	0	4	2	40	60	100	ESC
CSE/IT 253	Operating Systems LAB	0	0	4	2	40	60	100	ESC
	Total	22	4	12	26	360	540	900	

**II / IV B.Tech., (COMPUTER SCIENCE & ENGINEERING)
(SEMESTER – IV)**

II YEAR II SEMSTER

Course details		Scheme of Instruction				Scheme of Examination			Cat code
Code	Subject	L	T	P	C	Maxi Internal Marks	Maxi External Marks	Total Marks	
CSE/IT 221	Mathematics IV (Probability & Statistics)	4	-	0	4	40	60	100	HSC
CSE/IT 222	Computer Organization & Architecture	4	1	0	4	40	60	100	ESC
CSE/IT 223	UNIX Shell Programming	4	1	0	4	40	60	100	ESC
CSE/IT 224	Logic Foundations of Computer Science	4	1	0	4	40	60	100	ESC
CSE/IT 225	Introduction to Algorithms	4	1	0	4	40	60	100	ESC
CSE/IT 226	Object Oriented Programming using Java	4	-	0	4	40	60	100	ESC
CSE/IT 261	Advanced Communications Skills Lab(Audit Course)	0	0	4	0	40	60	100	HSC
CSE/IT 262	Unix Lab	0	0	4	2	40	60	100	ESC
CSE/IT 263	Algorithms Lab(through core Java)	0	0	4	2	40	60	100	ESC
	Total	22	4	12	28	360	540	900	

MATHEMATICS – III

CS/IT/EC/EE/EI /ME 211

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UNIT – I

Partial Differential Equations:

Introduction - Formation of Partial Differential Equations - Solutions of a Partial Differential Equation- Equations solvable by direct Integration - Linear Equations of the first Order- Non-Linear Equations of the first Order- Charpits Method - Homogeneous Linear Equations with Constant Coefficients- Rules for finding The Complementary Function - Rules for finding the Particular Integral- Non – Homogeneous Linear equations.

{CH: 17; Sections: 17.1 – 17.10 and 17.12 of [1]}

UNIT – II

Integral Transforms:

Introduction- Definition – Fourier integrals – Fourier integral theorem (without proof)- Fourier sine and cosine integrals – complex form of Fourier integral - Fourier Transforms - Properties of Fourier Transforms - Finite Fourier sine and cosine transforms - Convolution theorem (without proof), Parseval's Identity for Fourier Transforms(without proof)

{CH:22; Sections: 22.1 – 22.7 of [1]}

Numerical Solutions of Equations:

Introduction - Solution of Algebraic and Transcendental Equations - Bisection method- Newton- Raphson Method - Solutions of linear Simultaneous Linear Equations: iterative Methods - Gauss-Seidel Method.

{CH:28; Sections: 28.1, 28.2, 28.7}

UNIT-III

Finite Differences and Interpolation:

Finite Differences – Differences of a polynomial – factorial notation – relations between operators – Newton's Interpolation formulae – central difference interpolation formulae - Gauss interpolation formulae – stirlings formula - interpolation with unequal intervals – Lagranges interpolation – inverse interpolation.

{CH:29; Sections: 29.1 – 29.7, 29.9, 29.10, 29.13}

UNIT-IV

Numerical Differentiation and Integration:

Numerical Differentiation – Formulae for derivatives.

Numerical Integration: Trapezoidal rule - Simpson's one-third rule - Simpson's three-eighth.

Numerical Solution of Ordinary Differential Equations: Introduction – Picard's Method- Euler's Method - Runge- Kutta Method of fourth order.

Numerical Solution of Partial Differential Equations: Introduction - Classification of second order equations

{CH 30; Sections: 30.1,30.2, 30.4, 30.6, 30.7: 32.1}

TEXT BOOK: 1. B.S. Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers,

REFERENCE BOOKS:

2. N.P. Bali, A textbook of Engineering Mathematics, Laxmi publications

3. Erwin Kreyszig, Advanced Engineering Mathematics, 8th Edition, New Age International (P) Ltd

4. Engineering Mathematics – I BY N.P. Bali, Satyanarayana Bhavanari and Indrani Kelker Laxmipublications, New Delhi.

Objectives

To impart the essential knowledge on the fundamentals and applications of digital circuits and digital computing principles

To provide an overview on the design principles of digital computing systems

To provide technical knowledge about various digital hardware components

UNIT-I**(14 Periods)**

Review of Number systems & codes, Representation of integers and Floating point numbers, Accuracy. Introduction to integer arithmetic operations.

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 operations, Digital Logic Gates.

SIMPLIFICATION OF BOOLEAN FUNCTIONS: The Map Method, Two and three variable Maps, Four-variable Map, Five and six-variable Maps, Product of Sums Simplification, NAND and NOR implementation, other two-level implementations, Don't-Care conditions, The Tabulation Method, Determination of Prime Implicants, Selection of Prime-Implicants.

UNIT – II**(14 Periods)**

COMBINATIONAL LOGIC: Design Procedure, Adders, Subtractors, Code conversion, Analysis procedure.

COMBINATIONAL LOGIC WITH MSI AND LSI: Binary parallel adder, Decimal adder, Magnitude comparator, Decoders, Multiplexers.

UNIT –III**(18 Periods)**

SEQUENTIAL LOGIC: Flip Flops, Triggering of Flip-Flops, Synthesis and Analysis of Clocked Sequential Circuits, State tables and State diagrams. State Reduction and assignment, Flip-Flop Excitation tables, Design Procedure, Design of counters, Design with state equations.

UNIT –IV**(18 Periods)**

REGISTERS, COUNTERS: Registers, Shift registers, Ripple counters, Synchronous counters, Timing sequences.

MEMORIES: Classification of ROMs, EPROMs, EEPROMs, RAMs
PROGRAMMABLE LOGIC: Read only memory (ROM), Programmable logic device (PLD), Programmable logic array (PLA), Programmable array logic (PAL).

Outcomes

Gain knowledge on the basic logics and techniques related with digital computers.

Expertise to design and implement various complicated digital systems

Text Book:

1. Mano and Clietty- Digital Design- Pearson Education

Reference Books:

1. Morris Mano- Computer Engineering Hardware Design- PHI.
2. R.P.Jain- Modern digital electronics, 3rd edition- TMH.
3. Donald e Givone- Digital Principles and Design- TMH.

Objectives

To know the basics such as process and CPU scheduling algorithms

To understand the critical regions and dead lock problem

To understand virtual memory concept, thrashing problem and page replacement algorithms

To understand the file tables, access algorithms, and spoofing

UNIT-I**(16 Periods)**

Introduction : Operating System Structure – Operating System Operations – Process Management – Memory Management – Storage Management – Protection and Security – Distributed Systems – Special purpose Systems – Computing Environments.

System Structure: Operating System Services – User Operating System Interface – System Calls – Types of System Calls – System Programs – Operating System Design and Implementation – Operating System Structure – Virtual Machine – Operating System Generation – System Boot.

Process Concept : Overview – Process Scheduling – Operations on Processes – Interprocess Communication – Examples of IPC Systems – Communication in Client Server Systems.

UNIT-II**(16 Periods)**

Multithreaded Programming : Overview – Multithreading Models – Thread Libraries – Threading Issues – Operating System Examples.

Process Scheduling: Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple Processor Scheduling – Thread Scheduling.

Synchronization: Background – The Critical Section Problem – Peterson's solution – Synchronization Hardware – Semaphores – Classic Problem of Synchronization – Monitors – Synchronization Examples – Atomic Transaction.

UNIT-III**(16 Periods)**

Deadlocks : System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock.

Memory Management Strategies: Background – Swapping – Contiguous Memory Allocation – Paging – Structure of the Page Table – Segmentation – Example: The Intel Pentium.

Virtual Memory Management: Background – Demand Paging – Copy on Write – Page Replacement – Allocation of Frames – Thrashing.

UNIT-IV**(16 Periods)**

File System : File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection.

Implementing File Systems :File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free Space Management – Efficiency and Performance – Recovery – Log structured File Systems.

Secondary Storage Structure : Overview of Mass – Storage Structure – Disk Structure – Disk Attachment – Disk Scheduling – Disk Management – Swap Space Management – RAID structure.

I/O Systems: Overview – I/O Hardware – Application I/O Interface – Kernel I/O Interface – Transforming I/O requests to Hardware Operations – Streams – Performance.

TEXT BOOKS:

1. Silberschatz & Galvin, 'Operating System Concepts', 5th edition, John Wiley & Sons (Asia) Pvt.Ltd.

REFERENCE BOOKS :

1. William Stallings, "Operating Systems – Internals and Design Principles", 5/e, Pearson.
2. Charles Crowley, 'Operating Systems : A Design-Oriented Approach', Tata McGraw Hill Co., 1998 edition.
3. Andrew S.Tanenbaum, 'Modern Operating Systems', 2nd edition, 1995,
4. Bhatt, An Introduction to Operating Systems-PHI

Outcomes

Implement CPU scheduling algorithms and resolve problems related to critical regions

Implement page replacement algorithms like FCFS, LRU, etc.

Implement file systems,log structured file systems.

DISCRETE MATHEMATICAL STRUCTURES

WEF: 2016-17

CSE/IT 214

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4	0	0	100

UNIT – I

Foundations: Sets, Relations and Functions, Methods of Proof and Problem Solving Strategies, Fundamentals of Logic, Logical Inferences, Methods of Proof of an implication, First order Logic & Other methods of proof, Rules of Inference for Quantified propositions, Disjunction normal forms, Conjunction normal forms, Mathematical Induction.

UNIT – II

Elementary Combinatorics, Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with repetitions, Enumerating Permutation with Constrained repetitions.

UNIT – III

Recurrence relations, Solving recurrence relations by Substitution and generating functions. The methods of characteristic roots.
Relations and digraphs, Special properties of binary relations, Equivalence relations. Operations on relation.

UNIT – IV

Ordering relations, Lattices and Enumerations, Paths and Closures, Directed Graphs and Adjacency Matrices, Application : Topological Sorting.

Graphs: Basic Concepts, Isomorphisms and Subgraphs, Planar Graphs, Euler's Formula; Multigraphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four Color Problem.

TEXT BOOK:

1. Toe L.Mott, Abraham Kandel & Theodore P.Baker, Discrete Mathematics for Computer Scientists & Mathematicians, PHI 2nd edition,2008.
2. J.P. Trembly and R. Manohar- Discrete Mathematics for Computer Scientists & Mathematicians, PHI Ltd., New Delhi, 2nd Edition, 2008.
3. Narasingh deo Graph Theory , Narosa Publishers
4. Satyanarayana Bhavanari. and Syamprasad Kuncham. "Discrete Mathematics and Graph Theory" by PHI, 2014 second edition.
5. Satyanarayana Bhavanari, T.V.Pradeep Kumar, Sk. Mohiddin shaw " Mathematical Foundations for Computer Sciences" by BS Publications, first editions, 2016.

REFERENCE BOOKS:

1. T. Sengadir- Discrete Mathematics-Pearson Education
2. C.L. Liu and D.P. Mohapatra-Elements of Discrete Mathematics, Tata McGraw-Hill ,3rd Edition, 2008.
3. Seymour Lipschutz, Lipson-Discrete Mathematics-Scaums outlines-TMH.
4. Santha-Discrete Mathematics-Cengage Learning
5. Kenneth H Rosen-Discrete Mathematics & its Applications , TMH, 6ht Edition, 2009

Objectives

To understand the various techniques of sorting and searching

To design and implement arrays, stacks, queues, and linked lists

To understand the complex data structures such as trees and graphs

Unit –I

Development of Algorithms -Notations and analysis -Storage structures for arrays - Sparse matrices -Stacks and Queues: Representations and applications.

Unit –II

Linked Lists -Linked stacks and queues -Operations on polynomials -Doubly linked lists -Circularly linked lists -Dynamic storage management
-Garbage collection and compaction.

Unit –III

Binary Trees -Binary search trees -Tree traversal -Expression manipulation
-Symbol table construction-Height balanced trees -Red-black trees.

Graphs -Representation of graphs -BFS, DFS -Topological sort -Shortest path problems.

Unit –V

Searching and Sorting Techniques - Linear search -Binary search -Hashtable
Methods .Selection, Bubble, Insertion, Merge, quick,Heap and Radix sort

Outcomes

Ability to write programs to implement stacks, queues, linked lists .

Application of trees and graphs in real world scenarios.

Technically know how on the implementation of sorting searching algorithms.

Text Books

1.J. P. Tremblay and P. G. Sorenson, "An Introduction to Data Structures with applications", Second Edition, Tata McGraw Hill, 1981

2.M. Tenenbaum and Augestien, "Data Structures using C", Third Edition, Pearson Education 2007.

Reference Book

1.Sartaj Sahni, "Data Structures, Algorithms and Applications in C++", Universities Press (I) Pvt. Ltd

UNIT – I**(18 Periods)**

Human Values: Morals, Values and Ethics – Integrity – Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – caring – Sharing – Honesty – Courage – Valuing Time – Co-operation – Commitment – Empathy – Self-Confidence – Character – Spirituality.

UNIT – II**(12 Periods)**

Engineering Ethics: Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Professions and Professionalism – Professional Ideals and Virtues – Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories.

UNIT – III**(18 periods)**

Engineering as Social Experimentation: Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

Safety, Responsibility and Rights: Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and reducing risk.

Collegiality and Loyalty – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) - Discrimination

UNIT – IV**(12 Periods)**

Global Issues: Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership – Sample Code of Ethics like ASME, ASCE, IEEE, Institution of Engineers (India), Indian Institute of Materials Management, Institution of electronics and telecommunication engineers (ISTE), India, etc.

Text Books:

1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw Hill. New York 1996.
2. Govindarajan. M, Natarajan. S, Senthilkumar. V.S, "Engineering Ethics", Prentice Hall of India, 2004.

References:

1. Charles D Fleddermann, "Engineering Ethics", Prentice Hall, New Jersey, 2004 (Indian Reprint).
2. Charles E Harris, Michael S Pritchard and Michael J Rabins, "Engineering Ethics Concepts and Cases", Thompson Learning, United States, 2000 (Indian Reprint now available).
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003.

Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.

1. Code the following list ADT operations using array, single linked list, double linked list.

(a) void is_emptyList(List 1)	(b) List makeNullList(size n)
(c) Position firstPost(List 1)	(d) Position endPost(List 1)
(e) Position nextPost(List 1, Position p)	(f) Position prevPos(List 1, position p)
(g) Position find(List 1, Element x)	(h) Position findKth(List 1, int k)
(i) void insert(List 1, Position p)	(j) void delete(List 1, Position p)
(k) void append(List 1, Element x)	(l) int cmp(List 1, Position p1, Position p2)
(m) int cmp2(List11, List12, Position p1, Position p2)	
(n) void swap(List 1, Position p1, Position p2)	
(o) Element retrieveElement(List 1, Position p)	
(p) void print element(List 1, Position p)	
2. Using the above List ADT operations, Write a menu driven program to support following higher level list operations:
 - (a) Create null list
 - (b) Read a list of elements into the list.
 - (c) Insert an element in the Kth position of the list
 - (d) Delete an element in the Kth position of the list
 - (e) Delete a given element from the list
 - (f) Find whether given element is present in the list
 - (g) Display the elements of the list
3. Write a program that reads two lists of elements, prints them, reverses them, prints the reverse list, sort the lists, print the sorted lists, merges the list, prints merge list.
4. Implement a polynomial ADT and write a program to read two polynomials and print them, adds the polynomials, prints the sum, multiply the polynomials and print the product.
5. Implement stack ADT and write a program that reads an infix arithmetic expression of variables, constants, operators (+, -, *, /) and converts it into the corresponding postfix form. Extend the program to handle parenthesized expression also.
6. Implement Queue ADT and write a program that performs Radix sort on a given set of elements.
7. Implement the following sorting operations:-

(a) Shell Sort,	(b) Heap Sort	(c) Merge Sort	(d) Quick Sort
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8. Implement Binary Tree ADT and write a program that reads postfix Arithmetic expression form, builds the expression tree and performs tree Traversal on it.
9. Implement Binary search Tree ADT and write a program that interactively allows

(a) Insertion	(b) Deletion	(c) Find_min	(d) Find_max	(e) Find operations
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10. Implement AVL Tree ADT and Write a program that interactively allows

(a) Insertion	(b) Deletion	(c) Find_min	(d) Find_max
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1. Logic Gates using Discrete Components
2. Logic gates using Universal Gates
3. Implementation of Full Adder and Full Subtractor using gates
4. Implementation of parallel adder
5. Implementation of Multiplexer and Demultiplexer
6. Implementation of SR,T-type, D-type and JK Flip Flops
7. Implementation of universal Register
8. Design of synchronous counter
9. Design of asynchronous counters
10. Design of module-N counter and Johnson's ring counter

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 Etc. ...
 8. Simulate Paging Technique of memory management
 9. Program which demonstrates deadlock between two processes.
 9. Programs on Inter process communication using pipes and shared memory.
 10. Create a semaphore operation on a shared file for write but not read.
- .

PROBABILITY & STATISTICS

Wef 2016-17

CSE/IT 221

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UNIT-I:

Probability Densities: Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial Distribution, Other Probability Densities, Uniform Distribution, Gamma Distribution, Beta Distribution, Weibull Distribution, Joint Distributions, Discrete and Continuous.

Sampling Distribution: Populations and Samples, Sampling distribution of the Mean (σ known), Sampling distribution of the Mean (σ Unknown), Sampling distribution of the Variance.

UNIT-II:

Inferences Concerning Means: Point Estimation, Interval Estimation, Tests of Hypotheses, Null Hypotheses and other definitions, Procedure for tests of hypotheses, Hypotheses Concerning one Mean, Inferences Concerning Two Means.

UNIT-III:

Inferences Concerning Variances: Estimation of Variances, Hypotheses Concerning One Variance, Hypotheses Concerning Two Variances.

Inferences Concerning Proportions: Estimation of Proportions, Hypotheses Concerning One Proportion, Hypotheses Concerning Several Proportions, Analysis of $r \times c$ Tables, Goodness of Fit.

UNIT-IV:

Quality Control, Control Charts of Measurements, Control Charts for Attributes, Tolerance Limits, Acceptance Sampling.

Applications to Reliability and Life Testing: Reliability, Failure-Time Distributions, Exponential Model in Reliability, Exponential Model in Life Testing.

TEXT BOOK:

1. Miller & Freund's "Probability and Statistics for Engineers", 6th Edition, PHI by Richard A. Johnson.

REFERENCE BOOK:

2. S.C. Gupta & V.K. Kapoor, "Fundamentals of Mathematical Statistics", S.C. Chand & Co.,

UNIT - I**(20 Periods)**

REGISTER TRANSFER AND MICRO-OPERATIONS: Register Transfer Language, Register Transfer, Bus and memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic Shift Unit.

BASIC COMPUTER ORGANIZATION AND DESIGN: Instruction codes, Computer Registers, Computer Instructions, Timing and Control, Instruction cycle, Memory-Reference Instruction, Input-Output and Interrupt, Design of Basic Computer, Design of Accumulator Logic.

UNIT-II**(20 Periods)**

MICRO PROGRAMMED CONTROL: Control Memory, Address Sequencing, Micro-Program example, Design of Control Unit.

CENTRAL PROCESSING UNIT: General register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer (RISC).

COMPUTER ARITHMETIC: Addition and Subtraction, Multiplication Algorithms, Division Algorithms Floating-point Arithmetic operations.

UNIT -III**(15 periods)**

MEMORY ORGANIZATION: Memory Hierarchy, Main Memory, Auxiliary memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management hardware

INPUT-OUTPUT ORGANIZATION: Peripheral Devices, Input-output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA), Input-Output Processor, Serial Communication.

UNIT-IV

Pipelining: Linear pipeline processor, nonlinear pipeline processor, Instruction pipeline Design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch Handling techniques, branch prediction, Arithmetic Pipeline Design, Computer Arithmetic principles, Static Arithmetic pipeline, Multifunctional arithmetic pipelines.

Textbook:

1. Morris M. Mano, 'Computer Systems Architecture', 3rd edition-Pearson Education

Reference Books:

1. John P Hayes, 'Computer Architecture and Organization', 2nd edition.
2. V.Carl Hamacher et.al, 'Computer Organization' 2nd edition.
3. Tanenbaum: Structured Computer Organization, Pearson Education
4. William Stallings: Computer Organization and Architecture, PHI

UNIT I**(18 hours)****Introduction to unix** : Unix architecture , Features of Unix, Vi editor.**Directory Related utilities-** pwd, mkdir, ls, cd , rmdir.**File Handling and Text Processing utilities-** cp, mv, rm, ln, unlink, lp, cat, more, pg , head, tail, sort ,nl, grep, egrep, fgrep, cut, paste, join, tee, w ,chgrp, chmod, chown, find, cmp, diff, uniq, tr.**Disk utilities,Backup and other utilities-** du, df, mount, unmount, umask, ulimit, tar, cpio, dump , who, mail, compress, uncompress, gzip, gunzip, crypt, sed, tty,**Networking utilities** – finger, telnet, rlogin, ftp, rcp, write, talk, wall.**Programmable text processing: awk** - awk programs, accessing individual fields, Begin and end, operators, variables, control structures, extended regular expressions, condition Ranges, field separators, Build – in functions.**UNIT-II****(20 hours)****Bourne Shell programming:** Shell, functions of the shell , Meta characters, Input redirection, Output redirection, pipes, shell as programming language, shell variables, predefined local variables, predefined environment variables, Arithmetic, conditional expressions, control structures, positional parameters, passing command line arguments, Built – in Shell commands and shell programs.**Unix Internals:** Kernel Basics, File System, Process Management.**UNIT-III****(18 hours)****File management system calls** : Regular file management system calls – open(), read(), write(), lseek(), Close(),unlink(),stat(), getdents(). Miscellaneous file management system calls – chown() and fchown(), chmod() and fchmod(), dup() and dup2(), fcntl(), ioctl(), link(), mknod(), sync(), truncate() and ftruncate().**Process Management:** Creating a new process – fork(),orphan processes, terminating a process – exit(), zombie processes, waiting for child – wait(), Differentiating a process – exec(), changing directories – chdir(), changing priorities- nice(), Accessing user and Group ID's , file locking – deadlocks.**UNIT IV****(18 hours)****Signals:** The defined signals, A list of signals, terminal signals, Requesting on Alarm signal – alarm(), handling signals – signal(), protecting critical code and chaining interrupt handlers, sending signals – kill(), Death of children, suspending and Resuming processes, process Group's and control terminals.**Inter process communication:** Pipes, Sockets, shared memory, semaphores.**Text Book:**1 “**Unix for programmers and users**” 3rd edition by Graham Glass, King Ables, Pearson Education .**Reference Books:**

1. “**Advanced programming in the unix environment**” w- Richard Stevens 2nd Edition Pearson education
2. “**Unix programming environment**”, Kernighan and pike, Pearson education.
3. “**Your unix the ultimate guide**” Sumitabha Das, TMH 2nd edition.
4. “**Advanced unix programming**” by Marc J. Rochkind, 2nd edition Pearson

Objectives

To study about the notions, mechanisms, and properties of weakest preconditions

To learn how to create a strong guarded commands and its related theorems

To learn the basics of propositional logic and its conversions

To analyze the principles and proofs of predicate calculus.

Outcomes

Ability to define and convert the propositional formula

Knowledge of predicate calculus and its application in programming

Ability to prove program correctness using the logics.

Unit – I

Review of Propositional Calculus - Validity - Satisfiability related concepts - CNF and DNF forms - Conversion of arbitrary propositional formula to CNF or DNF.

Unit – II

Compactness idea - Resolution principle and proof of the theorem - Review of predicate calculus- Interpretation of formulae in predicate calculus.

Unit – III

Prenex normal form and examples - Application of logic in programming - Proof rules for structured statements (assignment, while, repeat-until, for statements).

Unit – IV

Pre-conditions / Post-conditions - Weakest precondition - Notion of machine - Mechanism and Wp as a predicate transformer - Properties of Wp.

Unit – V

Guarded Commands - General form of if command - Wp of if - Related theorem - General form of do command - Wp of do - Need for strong guards.

Text Books

D. Gries, "The Science of Programming", Narosa, 1981

S. Alagic, M. A. Arbib, "The Design of Well-Structured and Correct Programs", SpringerVerlagn, 1978

Reference Book

E. W. Dijkstra, "A Discipline of Programming", Prentice Hall, Englewood Cliffs, 1976

Objectives

To understand the importance of algorithm and its complexity

To analyze the complexity of an algorithm in terms of time and space complexities

To design and implement various programming paradigms and its complexity

UNIT – I (17 periods)

Introduction:

Algorithm Design paradigms – motivation, concept of algorithmic efficiency, run time analysis of algorithms, Asymptotic Notations.

Divide and Conquer:

Structure of divide and conquer algorithms: examples, quick sort,

Strassen Multiplication; Analysis of divide and conquer run time recurrence relations.

UNIT – II (20 periods)

Greedy Programming:

Overview of the greedy paradigm examples of exact optimization

solution, Approximate solution (Knapsack problem) Shortest-Path Algorithms – Unweighted Shortest Paths – Dijkstra’s Algorithm – Minimum Spanning Tree – Prim’s and Kruskal’s algorithms.

Dynamic Programming: Overview, difference between dynamic programming and divide and conquer, Applications: Shortest path in graph, Matrix multiplication, Traveling Salesman Problem, longest Common sequence.

UNIT – III (15 periods)

Graph Searching and Traversal: Overview, Traversal methods

(depth first and breadth first search), Applications of DFS – connected components, Bi-connected components.

Back tracking: Overview, 8-queen problem and Knapsack problem.

UNIT – IV (18 periods)

Branch and Bound:

LC searching Bounding, FIFO branch and bound, LC branch and bound

application: 0/1 Knapsack problem, Travelling Salesman Problem.

Computational Complexity: Complexity measures, Polynomial Vs Non-polynomial time complexity; NP-hard and NP-complete classes, examples.

TEXT BOOK:

1.E. Horowitz, S. Sahni and S.Rajsekran, “Fundamentals of Computer Algorithms”, Galgotia Publication.

REFERENCE BOOKS:

1.T. H. Cormen, Leiserson, Rivest and Stein, “Introduction of Computer Algorithm”, PHI.

2.Sara Basse, A.V. Gelder, “Computer Algorithms”, Addison Wesley.

3. E.Sreenivasa Reddy, “Design and Analysis of Algorithms”, Sci-Tech Publications.

CSE/IT 226 Object oriented programming using Java

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UNIT-1

Introduction :Approaches to Software Design, Evolution of the Object Model, Benefits of Object Programming ; Object Model: Objects, Classes, Subclassing and Inheritance, Polymorphism
Object Programming in Windowed Environments: Benefits of OOP in Windowed Application Environments, Application Frameworks and Class Libraries

UNIT-II

Overview of Java :Data types : Operators and Control statement
Classes and Inheritance:class,object,Methods,consructors, Garbage collection, Access control.
Packages and Interfaces :Access protections : Importing packages; defining interface, implementing interface and applications of Interfaces
Exception handling :Fundamentals : Exception types; try, catch, throw,throws and finally;
Nested try statements and propagation of thrown exception, creating your own exception subclasses.

UNIT-III

Multithreaded programming :Thread model; Thread priorities; Synchronization and interthread communication.
I/O and Applets :Streams; File I/O; Applets; Parameter passing to applets.
Event Handling :Event model; Event Classes; Event listeners interfaces.

UNIT-IV

Abstract Window Toolkit :AWT Classes; Component; Container; Panel; Window;
FrameCanvas; Graphics; AWT controls; Layout Managers; Buttons; Check Boxes; Choices;
Lists; Scroll Bars; Text fields; Text Areas; Menus; Dialog Boxes; GUI bases programs.
Java Library : String handling

Reference Books:

1. The Complete Reference Java 2, Seventh Edition - Patrik Naughton & Herbert Schidt , Tata McGraw Hill Publication
2. Just Java, Second Edition – Peter Vander Linden, Sun Soft Press
3. Special Edition Using Java 2 Platform – Weber, Practice Hall of India
4. Java How to Program, Third Edition – Deitel and Deitel, Peason Education Asia

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CSE/ IT 261	ADVANCE COMMUNICATION SKILL& SOFT SKILLS LAB (AUDIT)	0	0	3	-	0

Syllabus:

Module-1: Phonetics

- a) Introduction to vowels and consonants
- b) Introduction to Accent, Intonation and Rhythm

Module-2: Presentation Skills

- a) Debate
- b) Paper Presentation:
 - i) Identification of source material
 - ii) Arrangement of Collected Data
- c) Extempore

Module-3: Employability Skills

- a) Resume Preparation
 - i) Identification of information
 - ii) Arrangement of collected data
- b) Group Discussions
- c) Interview Skills
 - i) Dress code
 - ii) Behavioral Skills

Module-4: Telephonic Skills

- a) Formal & Informal interaction
- b) Receiving Messages & Complaints

Module-5: Soft Skills

- a) Voluntary & Involuntary Body Language
- b) Self-Esteem
- c) Creative Thinking
- d) Team Management

Module-6: Interpersonal and Intrapersonal Skills

- a) Motivation
- b) Stress Management
- c) Negotiation Skill
- d) Effective Listening

NOTE: 12 Lab Activities are minimum in Record (125 pages single side book) with contents: Name of the Activity, Source, Skill Improved.

Minimum Requirements:

The Communication and Soft Skills Lab shall need two labs. One is Communication Skills Lab with LAN facilitated 60 multimedia systems and English language software suggested by the concern faculty. The other, Conversational Skills Lab with 6 to 10 round tables, 60 movable chairs and audio-visual Devices with LCD Projector.

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD.
- Clarity Pronunciation Power

- The Rosetta Stone English Library
- Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge
- Language in Use, Foundation Books Pvt. Ltd with CD.
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Telephoning in English
- A Practical Course in Spoken English with CD by J.K. Gangal, PHI Publications.
- Communicate to Conquer: A Handbook of Group Discussions and Job Interviews with CD, PHI Publications.
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Reference Books: Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems) :

1. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.
2. English Pronouncing Dictionary Daniel Jones Current Edition with CD.
3. Spoken English- R. K. Bansal and J. B. Harrison, Orient Longman 2006 Edn.
4. Speaking English Effectively by Krishna Mohan & NP Singh (Macmillan)
5. A Practical Course in English Pronunciation, (with two Audio cassettes) by J. Sethi, Kamlesh Sadanand & D.V. Jindal, Prentice-Hall of India Pvt. Ltd., New Delhi.
6. A text book of English Phonetics for Indian Students by T.Balasubramanian (Macmillan)
7. English Skills for Technical Students, WBSCTE with British Council, OL
8. Soft Skills: Know Yourself & Know the World, Dr.K.Alex, S.Chand Publications
9. The ACE of Soft Skills: Attitude, communication and Etiquette for Success, by Pearson Publications.

Converston Developing Soft Skills,4th Edition,pearson Publication.

1. Working with different Unix commands, Pipes, I/O redirection.
2. Write Shell Programs for the following
 - a) Display all the words which are entered as command line arguments.
 - b) Changes Permissions of files in PWD as rwx for users.
 - c) To print the list of all sub directories in the current directory.
 - d) Program which receives any year from the keyboard and determine whether the year is leap year or not. If no argument is supplied the current year should be assumed.
 - e) Program which takes two file names as arguments, if their contents are same then delete the second file.
3. Write shell scripts for the following
 - a) To print the given number in the reversed order.
 - b) To print first 25 Fibonacci numbers.
 - c) To print the Prime numbers between the specified range.
 - d) To print the first 50 Prime numbers.
4. Write shell scripts for the following
 - a) To delete all lines containing the word 'unix' in the files supplied as arguments.
 - b) Menu driven program which has the following options.
 - i) contents of /etc/passwd
 - ii) list of users who have currently logged in.
 - iii) present working directory. iv) exit.
 - c) For sorting, searching and insertion, deletion of elements in the list
5. Program to transfer the data from one file to another file by using un-buffered I/O.
6. Program to create two processes to run a loop in which one process adds all even numbers and the other adds all the odd numbers (Hint: use fork ()).
7. Program to create to process 'i' and sends data to process 'j', prints the same after receiving it. (Hint: use vfork()).
8. Program to demonstrates orphan process .
9. Program which demonstrates how to avoid Zombie using wait() .

Objectives:

To learn how to analyze the complexity of algorithms

To compare and evaluate algorithms in terms of time and space complexity

To program brute force, divide and conquer, decrease and conquer, transform and conquer, greedy, and dynamic techniques

1. Estimating worst-case/average-case complexity of algorithms via programs
2. Programs involving some advanced data structures
3. Implementing merge sort using divide and conquer
4. Implementing knapsack problem using dynamic programming
5. Implementing strassen's multiplication problem
6. Implementation of Dijkstra's algorithm
7. Implementing Warshall's algorithm
8. Implementation of Prim's algorithm
9. Implementation of sum of subsets problem using back tracking
10. Implementing travelling sales men problem using branch and bound

Outcomes

Ability to solve and analyze general algorithms based on space and time complexity.

Ability to implement and empirically compare fundamental algorithms and data structures to real-world problems.

Knowledge about different algorithmic paradigms and optimization.