

**R G M COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
NANDYAL-518501, KURNOOL DIST., A.P., INDIA**

**DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING (CSE)**

RGM-R-2019



(ESTD-1995)

B.TECH SYLLABUS 2019

**Applicable for students admitted into
B.Tech (Regular) from 2019-20
B.Tech (Lateral Entry Scheme) from 2020-21
Regulations, Course Structure & Detailed Syllabus**

(Affiliated to J.N.T.U.A, Anantapuramu)

ACADEMIC REGULATIONS, COURSE STRUCTURE AND DETAILED SYLLABI

B.Tech. (Regular) from 2019-20 and B.Tech. (Lateral Entry Scheme) from 2020-21

For pursuing four year Bachelor Degree Program (under graduate) of study in Engineering (B.Tech.), Two year Master (post graduate) Degree of study in Engineering (M.Tech.), Two year Master (post graduate) degree of study in Business Administration (MBA), Three-year Master (post graduate) Degree of study in Computer Applications (MCA) offered by Rajeev Gandhi Memorial College of Engineering and Technology, Nandyal -518501 under Autonomous status and herein referred to as RGM CET (Autonomous).

All the rules specified herein approved by the Academic Council will be in force and applicable to students admitted from the Academic Year 2019-20 onwards. Any reference to “Institute” or “College” in these rules and regulations shall stand for Rajeev Gandhi Memorial College of Engineering and Technology (Autonomous).

All the rules and regulations, specified hereafter shall be read as a whole for the purpose of interpretation. As and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, the Principal, Rajeev Gandhi Memorial College of Engineering and Technology shall be the Chairman, Academic Council.

The candidate seeking admission into the first year of study of four year B.Tech degree Program should have:

- i) Passed either Intermediate Public Examination (IPE) conducted by the Board of Intermediate Education, Andhra Pradesh with Mathematics, Physics and Chemistry as optional subjects (or any equivalent examination certified by Board of Intermediate Education) or a Diploma in Engineering in the relevant branch conducted by the Board of Technical Education, Andhra Pradesh (or any equivalent examination certified by State Board of Technical Education) for admission.
- ii) Secured a rank in the EAMCET examination conducted by AP State Council for Higher Education (APSCHE) for allotment of a seat by the Convener, EAMCET, for admission.

Admission Procedure:

As per the norms of A.P. State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made to the first year of Four year B.Tech. Degree program as follows:-

- a) As per the norms of Government of Andhra Pradesh, A-Category (based on the rank obtained in EAMCET) seats will be filled by the Convener, EAMCET.
- b) As per the norms of Government of Andhra Pradesh, B-Category seats will be filled by the management.

Admission to the Second year of Four year B.Tech. Degree Program in Engineering:

- i) Candidates qualified in ECET and admitted by the Convener, ECET, in such cases for admission, when needed permission from the statutory bodies is to be obtained.
- ii) 10% of the sanctioned strength in each program of study (of RGM CET) shall be filled by the Convener, ECET as lateral entry.

List of Programs offered

1. B.Tech – Regular & Lateral Entry
2. M.Tech – Regular
3. MBA – Regular
4. MCA – Regular

Academic Regulations for 2019 B. Tech. (Regular)

(Effective for the students admitted into the I year from the Academic Year 2019-2020)

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The B.Tech. Degree be conferred by the Jawaharlal Nehru Technological University Anantapur, Anantapuramu, students who are admitted to the program and fulfill all the requirements for the award of the Degree as specified below:

1.0 Award of B.Tech. Degree

- 1.1 The student will be declared eligible for the award of the B. Tech. degree if he fulfils the following academic regulations:
- 1.2 Pursued a course of study for not less than prescribed course work duration and not more than double the prescribed course work duration.
- 1.3 Registered for 160 credits and secured 160 credits with compulsory subjects as listed in Table-1.

Table 1: Compulsory Subjects

S.No	SUBJECT PARTICULARS
1	All the subjects offered in B.Tech course / MOOCs
2	Mandatory Learning Courses [Environmental Science, Induction Program, Indian Constitution, Essence of Indian Traditional Knowledge]
3	All practical subjects
4	All Skill Development Courses/ value added courses
5	Mini projects
6	Comprehensive Viva-Voce
7	Seminar
8	Internship
9	Extra Academic Activities-EAA
10	Life Science
11	Project work Phase-I
12	Project Work Phase-II

2.0 Forfeit of seat

Students, who fail to fulfill all the academic requirements for the award of the degree within **eight academic years** from the year of their admission, shall forfeit their seat in B.Tech, course.

3.0 Courses of study

The following courses of study are offered at present as specializations for the B.Tech. Course: and any other course as approved by the authorities of the University from time to time.

1. **Civil Engineering**
2. **Computer Science and Engineering**
3. **Electrical and Electronics Engineering**
4. **Electronics and Communication Engineering**
5. **Mechanical Engineering**

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Table 2: Credits

Subject	Semester			
	Periods/ Week	Credits	Internal Marks (IM)	External Marks (EM)
Theory	2+1*	03	30	70
English Theory	2+1*	02	30	70
Life Science	02	02	30	70
Mandatory Learning Courses	03	00	00	00
Mini project/ Practical	03	1.5	25	50
Drawing	03	03	30	70
Skill Development Courses/Value Added Course	1+2*	0.5**	30	70
Comprehensive Viva (CV)	--	0.5	00	50
Extra Academic Activities	02	00	00	00
Seminar		0.5	50	00
Internship		1.0	00	Certificate from Internship Agency
Project Phase-I		1.0	25	00
Project Phase-II	--	08	25	100

* Tutorial

** [Skill Development / value Added Courses credits will not be considered for the award of division.

However, all these courses have to be cleared through internal evaluation by scoring minimum of 40% marks. The credits obtained in Skill development courses will be taken in to account for the award of degree.]

Note:- Mandatory Learning Courses /EAA will not carry any credits but attendance requirements of 75% should be fulfilled otherwise they have to reregister to fulfill academic requirements.

4.0 Distribution and Weightage of Marks

- 4.1 The performance of the student in each semester shall be evaluated subject –wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition, mini-project, Comprehensive Viva-Voce (CV) shall be evaluated for 50 marks each and the project work shall be evaluated for 150 marks.
- 4.2 For theory subjects, the distribution shall be 30 marks for Internal Evaluation (20 marks for internal test and 10 marks for assignment or field work/group task/Online test) and 70 marks for the End-Examination.
- 4.3 During the semester there shall be 2 tests for theory subjects. In each Internal test there shall be one compulsory (short answers) question and 3 descriptive questions are to be answered. The duration of internal test will be for 2hours. First test to be conducted in 3 units and second test to be conducted in the remaining 3 units of each subject. For awarding of 20 Internal marks the performance of the student in two Internal examinations conducted one in the middle of the semester and the other towards the end of the semester giving a weight age of 0.75 for the better score and 0.25 for the other score will be considered. There shall be two assignments in each subject (problem based/ field work/group task/Online test) for award of 10 marks so

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that internal component (marks) will be 30 marks (20 marks for internal test+10 marks for assignments / field work/group task).

Table 3: Units for Internal Tests

Semester
3 Units First Internal test
3 Units Second Internal test

- 4.4 In the case of Skill Development Courses, two Internal examinations shall be conducted one in the middle of the semester and the other at the end of the semester for 30 marks and the marks scored by the student in these exams with a weight age of 0.75 for better score and 0.25 for the other score will be awarded as Internal marks for 30. For the remaining 70 marks an end examination will be conducted along with other theory examinations. However skill development courses/Value added courses, end examination will be evaluated internally.
- 4.5 No makeup test for internal examination or assignments/group tasks will be conducted in any subject or practical. The student, who is absent for any test shall be deemed to have scored zero marks in that subject.
- 4.6 Open and Professional Electives will commence from 3rd year Second semester onwards. The open elective offered in 3-2 semester will be based on self-study/MOOCs. All the students have to opt for the MOOCs (Self Study) and should acquire the required credits. If the student fails to opt for MOOCs, (Under unavoidable circumstances) he/she has to write two internal tests besides the end examination conducted by the institute (Elective offered in place of MOOCs by the Dept.) like other subjects. However, he/she has to obtain the certificate from the organization in which he has registered. Any MOOCs course selected by the student should be of more than 45 hours duration /12 weeks course with minimum of 3 credits and also from the reputed organization. Attendance of the student who has opted for MOOCs will be taken from the remaining subjects and labs only in that semester while finalizing the attendance for fulfilling the minimum requirements of attendance for promotion to the next semester. Attendance will not be recorded for MOOCs.
- {Massive open online Courses (MOOCs')} B.Tech students can avail the facility of earning up to a maximum of 5% credits of their degree requirements through MOOCs. MOOC courses eligible for this purpose are the courses offered by NPTEL/SWAYAM/EDX/Course by any other reputed organisation approved by the department only. The student shall obtain prior approval of the Head of the Department before registering for MOOC's. MOOC courses can be taken in lieu of Elective courses such as Open Electives & Professional Electives (pertaining to their branch only) and Employability Enhancement Courses. No Core, Lab or Project Course can be dropped in lieu of MOOC. The student shall submit course Title, institute which offered MOOC, Examination system and Credits of the Course, duration of course - After deciding on the MOOC and a course which is approved as its equivalent in the curriculum a student can enrol for it and clear it any time as per his/her convenience and obtain the assessment certificate.

If the assessment certificate is submitted

- (i) Before the commencement of the semester in which the equivalent course is offered, the student will be exempted from attending the regular class work and internal assessment exams of the equivalent subject.
- (ii) During the semester the student is permitted to withdraw from the remaining part of the course work and internal assessment tests.

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(iii) After the semester is over but before the results of that semester are declared the student can request for considering his performance in the MOOC in lieu of its equivalent.

The student shall submit to the HOD the original certificate issued by MOOC authorities along with a photocopy of the same. The original will be returned after verification and verification shall be certified by the Head of the Department on the photocopy which shall be kept in records. An equivalent Grade corresponding to grade/marks awarded by MOOC agency shall be determined by a committee consisting of Principal, Controller of Examinations, Dean Student affairs and HoD concerned. This equivalent Grade shall be shown in the grade sheet and accounted in the SGPA and CGPA calculations.

- 4.7 Gap Year – Concept of student Entrepreneur in Residence shall be introduced and the outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time after I/II/III year to pursue full time entrepreneurship. This period may be extended for another one year (two years in total) and this period would not be counted for the maximum duration for completion of graduation. An evaluation committee shall be constituted to evaluate the proposal submitted by the student and committee shall decide on permitting the student for having the Gap Year. The committee consists of Principal as Chairman and all HODs as members.
- 4.8 In the open electives offered from III year II Sem onwards Student has to select the subjects among the list of open elective subjects by the other departments (inter - department). Student has to clear the subject as per norms to get the required credits. At least minimum of 40 students should register for any open elective; otherwise that open elective will not be offered.
- 4.9 Out of the professional electives offered from III Year II Semester onwards again one Professional elective in IV Year I Sem will be a MOOCs (Self Study) and the student has to acquire the required credits to clear the subject as specified in 4.6.
- 4.10 The institute would like to offer **Honours** and **Minor** as optional feature of the B. Tech program aimed at providing additional learning opportunities for academically motivated and bright students. In order to earn Honours or Minor, student has to earn a minimum of 20 extra credits. For this in addition to the regular subjects, a student has to pursue (Self-study/MOOCs) five additional subjects from 3-1 semester onwards and acquire the required credits. The Minor is indicated by separate CGPA and is reflected in the degree certificate as for example, B.Tech in ECE with Minor in Artificial Intelligence. Each department shall offer at least one Minor and also Honours. The student has to select the subjects which are not studied in their regular course and student should have cleared all the subjects up to and including 2-1 semester with above 8.5 CGPA (for SC/ST students 8.0 CGPA) to become eligible for registration for Honours/Minor. GPA and CGPA of 8.0 has to be maintained in the subsequent semesters without any backlog subjects in order to keep the Minor/Honours discipline registration active else Minor/Honours registration will be cancelled. The breakup of the credits are 5 subjects which carry 15 credits @3 credits per subject and project work carries 5 credits. The evaluation pattern of subjects and project work will be similar to methods followed in regular course evaluation. No attendance minimum will be considered for Honours/Minor. Not more than two subjects are allowed for registration in any semester for Honours/ Minor. The student is eligible to receive B.Tech with Honours if he acquires the required additional credits in the same discipline in which he is pursuing his B.Tech degree. If the students acquire the additional credits from other disciplines then he is eligible to receive B.Tech along with Minor degree in the specified area. Minimum strength for

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offering Minor/Honours in a discipline is considered as One-Fifth (20% of the class) of the class size and Maximum size would be Four-Fifth of Class size (i.e 80% of the class).

4.11 Extra - Academic Activity (EAA)

Each of the following activities carries 0 credits and every student is required to register for **two** activities during second year of study (one in each semester) which is mandatory.

- a) *NSS/NCC*
- b) *Games and Sports*
- c) *Yoga/Meditation*
- d) *Extension Activities*
- e) *Literary/ Cultural Activities*

Any other which may be offered in future.

The activities shall be carried out in the allotted hours. The activities will be monitored by the respective faculty in charge, senior faculty member of the department and the Department HOD. Grades will be awarded on the basis of participation, attendance, performance and behavior. Grades shall be entered in the marks statement as GOOD, SATISFACTORY and UNSATISFACTORY and shall not be counted towards CGPA calculation. If any student gets an Unsatisfactory Grade, he/she has to repeat the activity in the immediate subsequent year.

4.12 The student has an option of going for internship in IV year, II Sem in a reputed organization (The finalization of the internship organization will be as per college guidelines (HOD, two Senior faculty members of the department and same will be recommended to the Principal for approval). In case any student opted for internship he need not attend the classes however he has to write internal and external examination of subjects when ever conducted in that semester and acquire the required credits. The project work in the final semester may be carried out during the internship and same may be submitted for evaluation. Student has to acquire 01 credit by going for internship (minimum of Two weeks) / carrying out internal project work/ study project report on any industry/ attending workshop in reputed institutions for two weeks. Certificate from the organization has to be submitted to this effect attested by Head of the Department and internship incharge to the academic section before the commencement of 3-2 semester. Student is expected to carry out the activities mentioned here during the summer break before the commencement of 3-1 semester.

4.13 The medium of instruction for all Course work, Examination, Seminar Presentations, Project Reports and all academic activities shall be English.

5.0 Question Paper Pattern

5.1 Each Internal Test question paper shall contain 5 questions, of which the First question is compulsory and three questions are to be answered from the remaining four. Compulsory question carries 5 marks (It contains 5 questions of one marks - no choice in first question). The remaining 3 questions carry 5 marks each. Each question shall have a,b,c.... parts.

5.2 The End Examination question paper will have 7 questions and students have to answer 5 questions. However, the first question is compulsory and it consists of 7 short answer questions, each carrying 2 marks. The next 4 questions are to be answered from the remaining 6 questions and each carries 14 marks. Each 14 marks question shall have a, b, c .. parts. Evaluation of answer scripts shall be done by either Internal or External examiners appointed by the Principal. A minimum of 50% of subjects will be evaluated by external examiners.

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- 5.3 For practical subjects, there shall be a continuous evaluation during the semester for 25 internal marks and End Examination carries 50 marks. Of the 25 marks for Internal, 15 marks shall be awarded for day-to-day work, 5 marks to be awarded by conducting an internal laboratory test and 05 marks will be allotted for any creativity/innovation/ additional learning in lab beyond prescribed set of experiments etc. The End Examination shall be conducted by the teacher concerned and an external Examiner from other institutions.
- 5.4 For the subject having design and/or drawing, (such as Engineering Graphics, Machine Drawing etc.) and estimation, the distribution shall be 30 marks for Internal evaluation (15marks for day-to-day work and 5 marks for Internal tests and 10 marks for assignments) and 70 marks for End Examination. There shall be two internal tests in a Semester and the better of the two shall be considered for the award of marks for internal tests.
- 5.5 The Engineering drawing, wherever offered is to be treated as a theory subject. Evaluation method adopted for theory subjects shall be followed here as well.
- 5.6 There shall be two Mini-Projects, in collaboration with an industry/EPICS (Engineering Projects In Community Services) (wherever is possible) of their specialization, to be taken up during the vacation (data collection, components etc.) after II year II Semester and III Year II Semester examination and implementation/simulation shall be carried out in III year I Semester and IV Year I Semester during lab classes. Implementation or fabrication/simulation of mini projects will be treated as laboratory. However, the mini project and its report shall be evaluated in III year I Semester and IV Year I Semester. The mini project shall be submitted in the report form and should be presented before the committee, which shall be evaluated for 50 marks. The committee consists of an external Examiner, Head of the Department and the supervisor of mini project. There shall be 25 internal marks for mini project which will be awarded based on the performance and involvement of the student during mini project period.
- 5.7 There shall be comprehensive Viva-Voce examination at the end of each semester. CV Examination shall be conducted by the committee consisting of Senior faculty (based on the recommendation of HOD), an external Examiner from other institutions and HOD and evaluated for 50 marks.
- 5.8 The project topic should be approved by Internal Department Committee (IDC). Out of total 150 marks for the project work, 50 marks shall be for Internal Evaluation (25 marks for Phase-I and 25 marks for Phase-II) and 100 marks for the End Semester Examination. The evaluation of project work phase-I shall be conducted at the end of the IV year I semester and Phase-II shall be conducted at the end of the IV year II semester. The project viva voce examination will be conducted by the committee consisting of an external Examiner from other institute, Head of the Department and the supervisor of the project. The Internal evaluation for 50 marks shall be on the basis of two seminars (25 marks for Phase-I and 25 marks for Phase-II) given by each student on the topic of the project. The Internal evaluation of the project work for 50 marks shall be conducted by the committee consisting of head of the Department or his nominee, senior faculty member and the supervisor of project.
- 5.9 For all practical/mini project/main project/CV etc. the HOD of the concerned dept. shall submit a panel of 4 external examiners from different institutes and one will be selected by the Chief Superintendent of the Examination for conducting of end examination.
- 5.10 **Revaluation of End Examination Scripts:** Revaluation of End Examination scripts is allowed for theory subjects only by paying requisite fee. Procedure for

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Revaluation: The script will be revaluated by an examiner appointed by the Principal. The maximum of revaluation and regular end examination grade will be awarded for that subject. Student can apply for revaluation in a subject only once.

Table4: Distribution of weightages for examination and evaluation

Sl. No.	Nature of subject	Marks	Type of examination and mode of assessment		Scheme of Examination
1	Theory	70	End Examination. Both internal and external Evaluation (at least a minimum of 50% subjects will be sent for external evaluation)		End Examination in theory subjects will be for 70 marks.
		30	20	Internal Examinations (Internal evaluation)	These 20 marks are awarded to the students based on the performance in two (per semester) Internal examinations with a weightage of 0.75 for better score and 0.25 for the other score.
			10	Assignments/Field work/Group task/Online Test (Objective Type) (Internal evaluation)	Average of two assignments /Field work/group task in a semester each evaluated for 10 marks.
2	Practical	50	End lab examination (External evaluation)		This End Examination in practical subjects will be for a maximum of 50 marks.
		25	15	Internal evaluation	Day-to-day performance in lab experiments and record.
			05	Internal evaluation	Internal lab examination at the end of year/semester
			05	Internal evaluation	05 marks will be allotted for any creativity/ innovation/ additional learning in lab beyond prescribed set of experiments etc.
3	Mini Project	50	End Examination (External evaluation)		This End Examination in mini project will be for a maximum of 50 marks.
		25	Internal evaluation		Day-to-day performance in executing mini project.
4	Comprehensive Viva-Voce(CV)	50	External evaluation		This end viva voce examinations in all the subjects for 50 marks.
5	Project work	100	External evaluation		This end viva voce in project

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				work for 100 marks	
		50	Internal evaluation 25 marks for Phase-I 25 Marks for Phase-II	These 50 marks will be based on the performance of the student in the project reviews apart from attendance and regularity(25 marks for Phase-I and 25 marks for Phase-II)	
6	Skill Development Courses/ Value Added Course/ Mock interviews and Group Discussion	30	Internal evaluation	These 30 marks are awarded to the students based on the performance of two Internal examinations with a weight age of 0.75 for better score and 0.25 for the other score.	
		70	Internal Evaluation	Based on the performance in the end examination.	
7	Internship/Internal Project/Study Report/Work shop	00	-	Certificate form Internship Agency	
8	Life Science	70	External Evaluation	End Examination in theory subjects will be for 70 marks.	
		30	20	Internal Examinations (Internal evaluation)	These 20 marks are awarded to the students based on the performance in two (per semester) Internal examinations with a weightage of 0.75 for better score and 0.25 for the other score.
			10	Assignments/Field work/Group task/Online Test (Objective Type) (Internal evaluation)	Average of two assignments /Field work/group task in a semester each evaluated for 10 marks.
9	EAA	00	Internal evaluation	Based on performance and committee report.	
10	Mandatory Learning Courses	00	Internal evaluation	No examinations. Attendance minimum is required	

6.0 Attendance Requirements:

- 6.1 The student shall be eligible to appear for End examinations of the semester if he acquires a minimum of 75% of attendance in aggregate of all the subjects of that semester.
- 6.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in a semester may be granted by the College Academic Committee.
- 6.3 The student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester. They may seek re-admission for that semester when offered next.
- 6.4 **Shortage of Attendance below 65% in aggregate shall in NO case be condoned.**

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6.5 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.

6.6 The stipulated fee shall be payable towards condonation of shortage of attendance.

7.0 Minimum Academic Requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item No.6.0.

- 7.1 The student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical or design or CV or drawing subject or Skill Development Courses or project if he secures not less than 35% of marks in the End Examination and he has to score minimum of 40% marks from internal and external exam marks put together to clear the subject.
- 7.2 The student shall be promoted from II to III year only if he fulfils the academic requirement of securing a minimum of 40.5 credits out of 81 credits from all the exams conducted up to and including II year II semester regular examinations irrespective of whether the candidate takes the examination or not.
- 7.3 The student shall be promoted from third year to fourth year only if he fulfils the academic requirements of securing minimum of 61.5 credits out of 123 credits from all the exams conducted up to and including III year II semester regular examinations, whether the candidate takes the examinations or not.

Table 5: Promotion rules

Promotion from	Total credits to register	Minimum credits to obtain for promotion
II yr to III yr	81	40.5
III yr to IV yr	123	61.5

7.4 The student shall register and put up minimum attendance in all 160 credits and earn 160 credits. Grades obtained in 157 credits (excluding the credits obtained in Skill Development Courses/Value added courses) shall be considered for the calculation of CGPA.

7.5 Students who fail to earn 160 credits as indicated in the course structure in Table-1 within eight academic years from the year of their admission shall forfeit their seat in B.Tech. Course and their admission shall stand cancelled.

8.0 Course pattern:

8.1 The entire course of study is of four academic years. Each academic year consists of two semesters

8.2 The student is eligible to appear for the End Examination in a subject, but absent at it or has failed in the End Examination may appear for that subject at the supplementary examination.

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Table: 6: Course pattern

Year	Semester	No. of Subjects		No. of Skill Development Courses	Number of Labs		Total credits	
		CE/ME/CSE	ECE/EEE		CE/ME/CSE	ECE/ EEE		
First Year	First	05 {CE-I-HSMC LAC-BSC MEC/AC-BSC PEE/EM/BEM-ESC PPS-I-ESC}	05 {CE-I-HSMC LAC-BSC AP-BSC ED-ESC PPS-I-ESC}	00	CE/ME/CSE EC lab-BSC PPS-I Lab-ESC DEL Lab-HSMC CV-I	ECE/ EEE EP Lab-BSC PPS-I Lab-ESC EW&ITW-LC CV-I	4X3=12 1x2=02 3X1.5=4.5 1x0.5=0.5	19
	Second	05 {CE-II-HSMC OPDEVC-BSC AP/EP-BSC ED-ESC PPS-II-ESC}	05 {CE-II-HSMC OPDEVC-BSC MEC-BSC NA/BEE-ESC PPS-II-ESC}	00	EP lab-BSC PPS-II Lab-ESC EW&ITW-LC CV-II	EC lab-BSC PPS-II Lab-ESC DEL Lab-HSMC CV-II	4X3=12 1x2=02 3X1.5=4.5 1x0.5=0.5	19
Second Year	First	BSC Life Science Four Subjects	BSC Life Science Four Subjects	01	Subjects Life Science Labs CV (Comprehensive Viva)-III SDC/VAC EAA		5X3=15 1x2=2.0 3x1.5=4.5 1X0.5=0.5 1x0.5=0.5 No Credits	22.5
	Second	MC-1/MC-2/MC-3 Five Subjects SDC/VAC	MC-1/MC-2/MC-3 Five Subjects SDC/VAC	01	Subjects Labs CV (Comprehensive Viva)-IV SDC/VAC Mandatory Course-1/2/3 (ECE/CSE&EEE/CE&ME) (Indian Heritage, Culture Tradition) Mandatory Course-3 (Constitution of India) EAA		5X3=15 3X1.5=4.5 1X0.5=0.5 1x0.5=0.5 No Credits No Credits	20.5
Third Year	First	Five Subjects SDC/VAC MC-1/MC-2/MC-3	Five Subjects SDC/VAC MC-1/MC-2/MC-3	01	Subjects(05S) Labs SDC/VAC CV (Comprehensive Viva)-V Mandatory Course-1/2/3 (ECE/CSE&EEE/CE&ME) (Indian Heritage, Culture Tradition)		5X3=15 3X1.5=4.5 1x0.5=0.5 1X0.5=0.5 No Credits	20.5
	Second	03S + OEC1(MOOCs) + PEC1 MC-1/MC-2/MC-3	03S + OEC1(MOOCs) + PEC1 MC-1/MC-2/MC-3	01	Subjects(03S, OEC1, PEC1) Labs Mini Project-1 (EPICS) SDC/VAC CV (Comprehensive Viva)-VI Internship Mandatory Course-1/2/3 (ECE/CSE&EEE/CE&ME) (Indian Heritage, Culture Tradition) Mandatory Course-3 (Constitution of India)		5X3=15 2x1.5=3.0 1x1.5=1.5 1X.5=0.5 1X0.5=0.5 1x1.0=1.0 No Credits	21.5
Fourth Year	First	1S+PEC2+PEC3/(MOOCs)+PEC4+OEC2		01	Subjects (01S, PEC2, PEC3, PEC4, OEC2) Labs SDC/VAC CV (Comprehensive Viva)-VII Project Phase 1 Mini project-2 (EPICS)		5X3=15 2X1.5=03 1X0.5=0.5 1X0.5=0.5 1x1.0=1.0 1X1.5=1.5	21.5
	Second	PEC5 + OEC3		01	Subjects (PEC5, OEC3) SDC/VAC CV (Comprehensive Viva)-VIII Seminar Project Phase-2/Internship		2X3=06 1X0.5=0.5 1X0.5=0.5 1x.5=0.5 1X8=08	15.5
GRAND TOTAL								160
MC-1 (Environmental Studies), MC-2 (Indian Heritage, Culture Tradition), MC-3 (Constitution of India)								

9.0 Transitory Regulations:

Candidates who have been detained for want of attendance or not fulfilled academic requirements or who have failed after having undergone this course in earlier regulations or have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered subject to section 2.0 and they continue to be in the academic regulations in which they were readmitted.

10.0 With-holding of results:

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

11.0 Award of Class:

After the 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:

Table 7: Award of Division

Class Awarded	% of marks to be secured	Division/ Class	CGPA	CGPA secured from 157 Credits (Excluding the credits obtained in Skill Development Courses)
First Class with Distinction	70% and above	First class With Distinction	≥ 7.5	
First Class	Below 70% but not less than 60%	First Class	≥ 6.5 and < 7.5	
Second Class	Below 60% but not less than 50%	Second Class	≥ 5.5 and < 6.5	
Pass Class	Below 50% but not less than 40%	Pass	≥ 4 and < 5.5	

12.0 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 falls.

Table 8: Conversion into Grades and Grade points assigned

Range in which the % of marks in the subject fall	Grade	Grade point Assigned	Performance
90 to 100	O	10	Out standing
80 to 89.9	A ⁺	09	Excellent
70 to 79.9	A	08	Very Good
60 to 69.9	B ⁺	07	Good
50 to 59.9	B	06	Above Average
45 to 49.9	C	05	Average
40 to 44.9	P	04	Pass
<40	F	00	Fail
Ab	AB	00	Fail

12.1 Requirement for clearing any subject: The students have to obtain a minimum of 35% in End Examination and they have to score minimum of 40% marks from

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Internal and external exam marks put together to clear the subject. Otherwise they will be awarded fail grade.

12.2 F is considered as a fail grade indicating that the student has to reappear for the end supplementary examination in that subject and obtain a non-fail grade for clearing that subject.

12.3 In case of skill development/ value added course / soft skill subjects, as there is no end exam, all 100 marks are for internal assessment only. Student has to score 40% in these courses to complete the subject which will be evaluated internally. Marks obtained in these courses shall not be considered for award of Division.

12.4 To become eligible for the award of degree the student must obtain a minimum CGPA of 4.0

13.0 Supplementary Examinations:

Apart from the regular End Examinations, the institute may also schedule and conduct supplementary examinations for all subjects for the benefit of students with backlogs. Such students writing supplementary examinations as supplementary candidates may have to write more than one examination per day. For eighth semester, special (Advance) supplementary examinations will be conducted in second week following the results publication date of regular examination of eighth semester only.

14.0 Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA)

The Grade Point Average (GPA) for each semester and Cumulative Grade Point Average (CGPA) up to any semester is calculated as follows:

i) Semester Grade Point Average will be computed as follows:

$$GPA = \frac{\sum_1^n C_j \times GP_j}{\sum_1^n C_j}$$

Where, n is the number of subjects in that semester. C_j is Credits for the subjects. GP_j is the grade point obtained for the subject and the summation is over all the subjects in that semester.

ii) A Cumulative Grade Point Average (CGPA) will be computed for every student at the end of each semester. The CGPA would give the cumulative performance of the student from the first semester up to the end of the semester to which it refers to and is calculated as follows:

$$CGPA = \frac{\sum_1^m GPA_j \times TC_j}{\sum_1^m TC_j}$$

Where 'm' is the number of semester under consideration. TC_j the total number of credits for a jth semester and GPA_j is the Grade Point Average of the jth semester. Both GPA and CGPA will be rounded off to the second digit after decimal and recorded as such.

While computing the GPA / CGPA, the subjects in which the student is awarded zero grade points will also be included.

For any academic/employment purpose the following formulae shall be used for conversion of CGPA to % of marks. % of marks = (CGPA – 0.5) x 10.

15.0 Grade Sheet:

A grade sheet (Memorandum) will be issued to each student indicating his performance in all subjects of that semester in the form of grades and also indicating the GPA and CGPA.

16.0 Award of Degree

After having admitted into the program, B.Tech degree shall be conferred on a student who has satisfied the following conditions.

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- (i) The student joining with Intermediate qualification must have, after admission into the Regular B.Tech programme of the college, pursued a regular course of study for not less than four academic years and not more than eight academic years.
- (ii) The student joining under lateral entry scheme with diploma qualification must have, after admission into III Semester B.Tech, pursued a regular course of study for not less than three academic years and not more than six academic years.
- (iii) The student must have satisfied the minimum academic requirements in appropriate branch of engineering in each semester of the program, herein after prescribed.
- (iv) Students must register for all the courses and earn the credits specified
- (v) Students who fail to fulfil all the academic requirements for the award of degree within the specified period from the year of their admission shall forfeit their seat in B.Tech course and their admission stands cancelled.
- (vi) The student shall successfully complete non-credit courses like EAA/MC/Internship.
- (vii) The student has no dues to the institution, library, hostels etc.
- (viii) The student has no disciplinary action pending against him/her.

The Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Ananthapuramu on recommendations by the Academic council of RGM CET (Autonomous) basing on the eligibility as in clause 6.0 and 7.0.

17.0 Transcripts:

After successful completion of prerequisite credits for the award of degree, a Transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued if required after the payment of requisite fee and also as per norms in vogue.

18.0 Rules of Discipline:

- 18.1 Any attempt by any student to influence the teachers, Examiners, faculty and staff of Examination section for undue favours in the exams, and bribing them either for marks or attendance will be treated as malpractice cases and the student can be debarred from the college.
- 18.2 When the student absents himself, he is treated as to have appeared and obtained zero marks in that subject(s) and grading is done accordingly.
- 18.3 When the performance of the student in any subject(s) is cancelled as a punishment for indiscipline, he is awarded zero marks in that subject(s).
- 18.4 When the student's answer book is confiscated for any kind of attempted or suspected malpractice, the decision of the Chief Superintendent is final.

19.0 Minimum Instruction Days:

The minimum instruction days for each semester shall be 95 clear instruction days excluding the days allotted for tests/examinations and preparation holidays declared if any.

20.0 Amendment of Regulations:

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

21.0 Transfers

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

22.0 General:

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- 22.1 The Academic Regulations should be read as a whole for the purpose of any interpretation.
- 22.2 In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.
- 22.3 The Institute may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the Institute.
- 22.4 Where the words “he”, “him”, “his”, occur in the regulations, they include “she”, “her”, “hers”.

**Academic Regulations for B.Tech.
(Lateral Entry Scheme)**

(Effective for the students getting admitted into II year from the Academic Year 2020-2021 onwards)

- 1.0 The Students have to acquire a minimum of 122 credits out of 122 from II to IV year of B.Tech. Program (Regular) for the award of the degree.
- 2.0 Students, who fail to fulfil the requirement for the award of the degree in 6 consecutive academic years from the year of admission, shall forfeit their seat.
- 3.0 The same attendance regulations are to be adopted as that of B. Tech. (Regular).

4.0 Promotion Rule:

The student shall be promoted from third year to fourth year only if he fulfils the academic requirements of securing minimum of 42.5 credits out of 85 credits from all the exams conducted up to and including III year II semester regular examinations, whether the candidate takes the examinations or not.

5.0 Award of Class:

After the 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: The marks obtained in the best 119 credits will be considered for the calculation of percentage and award of class.

Table 1: Award of Division

Class Awarded	% of marks to be secured	Division/ Class	CGPA	CGPA secured from 119 Credits (Excluding the credits obtained in Skill Development Courses)
First Class with Distinction	70% and above	First class With Distinction	≥ 7.5	
First Class	Below 70% but not less than 60%	First Class	$6.5 \text{ and } < 7.5$	
Second Class	Below 60% but not less than 50%	Second Class	$\geq 5.5 \text{ and } < 6.5$	
Pass Class	Below 50% but not less than 40%	Pass	$\geq 4 \text{ and } < 5.5$	

- 6.0 All other regulations as applicable for B. Tech. Four-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme).

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I B.TECH, I-SEMESTER COURSE STRUCTURE

Subject Code	Name of the Subject	Hours/Week			Credits	Marks		
		Lecture/ Theory	Tutorial	Laboratory/ Practical		Internal	External	Total
THEORY								
A0001191	Communicative English - I	1	1	0	2	30	70	100
A0002191	Linear Algebra and Calculus	2	1	0	3	30	70	100
A0005191	Modern Engineering Chemistry	2	1	0	3	30	70	100
A0201191	Principles of Electrical Engineering	2	1	0	3	30	70	100
A0501191	Programming for Problem Solving - I	2	1	0	3	30	70	100
PRACTICALS								
A0091191	Engineering Chemistry Lab	0	0	3	1.5	25	50	75
A0591191	Programming for Problem Solving – I Lab	0	0	3	1.5	25	50	75
A0092191	Digital English Language Lab	0	0	3	1.5	25	50	75
A0093191	Comprehensive Viva - I	0	0	0	0.5	0	50	50
Contact Periods / Week		9	5	9	19	225	550	775

I B.TECH, II-SEMESTER COURSE STRUCTURE

Subject Code	Name of the Subject	Hours/Week			Credits	Marks		
		Lecture/ Theory	Tutorial	Laboratory/ Practical		Internal	External	Total
THEORY								
A0006192	Communicative English - II	1	1	0	2	30	70	100
A0007192	Ordinary, Partial Differential Equations and Vector Calculus	2	1	0	3	30	70	100
A0004191	Applied Physics	2	1	0	3	30	70	100
A0301191	Engineering Drawing	2	1	0	3	30	70	100
A0502192	Programming for Problem Solving - II	2	1	0	3	30	70	100
PRACTICALS								
A0094191	Engineering Physics Lab	0	0	3	1.5	25	50	75
A0593192	Programming for Problem Solving – II Lab	0	0	3	1.5	25	50	75
A0592191	Engineering Workshop and IT Workshop	0	0	3	1.5	25	50	75
A0095192	Comprehensive Viva - II	0	0	0	0.5	0	50	50
Contact Periods / Week		9	5	9	19	225	550	775

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II B.TECH, I-SEMESTER COURSE STRUCTURE

Category	Name of the Subject	Hours/Week			Credits	Marks		
		Theory	Tutorial	Lab		Internal	External	Total
THEORY								
A0014193	Probability and Statistics	2	1	0	3	30	70	100
A0503193	Python Programming	2	1	0	3	30	70	100
A0410193	Digital Logic Design	2	1	0	3	30	70	100
A0504193	Mathematical Foundation Of Computer Science	2	1	0	3	30	70	100
A0505193	Programming in C++ and Data Structures	2	1	0	3	30	70	100
A0010193	Biology for Engineers (Life Sciences)	2	0	0	2	30	70	100
A0011193	Aptitude, Arithmetic, Reasoning and Comprehension (Skill Development Course-I)	1	2	0	0.5	30	70	100
PRACTICALS								
A0594193	Python Programming Lab	0	0	3	1.5	25	50	75
A0595193	Programming in C++ and Data Structures Lab	0	0	3	1.5	25	50	75
A0496193	Digital Logic Design Lab	0	0	3	1.5	25	50	75
A0096193	Comprehensive Viva - III	0	0	0	0.5	0	50	50
Contact Periods / Week		13	7	9	22.5	285	690	975

II B.TECH, II-SEMESTER COURSE STRUCTURE

Category	Name of the Subject	Hours/Week			Credits	Marks		
		Theory	Tutorial	Lab		Internal	External	Total
THEORY								
A0507194	Java Programming	2	1	0	3	30	70	100
A0508194	Computer Organization and Architecture	2	1	0	3	30	70	100
A0509194	Formal Languages and Automata Theory	2	1	0	3	30	70	100
A0510194	Design and Analysis of Algorithms	2	1	0	3	30	70	100
A0511194	Database Management Systems	2	1	0	3	30	70	100
A0017194	Indian Heritage and Culture (Mandatory Learning Course-I)	2	0	0	0	0	0	0
A0016194	Design Thinking for Innovations (Skill Development Course-II)	1	2	0	0.5	30	70	100
PRACTICALS								
A0597194	Java Programming Lab	0	0	3	1.5	25	50	75
A0598194	Design and Analysis of algorithms Lab	0	0	3	1.5	25	50	75
A0599194	Database Management Systems Lab	0	0	3	1.5	25	50	75
A0097194	Comprehensive Viva - IV	0	0	0	0.5	0	50	50
Contact Periods / Week		13	7	9	20.5	255	620	875

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III B.TECH, I-SEMESTER COURSE STRUCTURE

Subject Code	Name of the Subject	Hours/Week				Marks		
		Theory	Tutorial	Lab	Credits	Internal	External	Total
THEORY								
A0513195	Computer Networks and Security	2	1	0	3	30	70	100
A0514195	Operating Systems	2	1	0	3	30	70	100
A0515195	Compiler Design	2	1	0	3	30	70	100
A0516195	Software Engineering	2	1	0	3	30	70	100
A0517195	Web Programming	2	1	0	3	30	70	100
A0015194	Environmental Science (Mandatory Learning Course-II)	2	0	0	0	0	0	0
A0019195	Professional Ethics and Soft Skills (Skill Development Course-III)	1	2	0	0.5	30	70	100
PRACTICALS								
A0582195	Computer Networks Lab	0	0	3	1.5	25	50	75
A0583195	Operating Systems Lab	0	0	3	1.5	25	50	75
A0584195	Web Programming Lab	0	0	3	1.5	25	50	75
A0098195	Comprehensive Viva - V	0	0	0	0.5	0	50	50
Contact Periods / Week		13	7	9	20.5	255	620	875

III B.TECH, II-SEMESTER COURSE STRUCTURE

Subject Code	Name of the Subject	Hours/Week				Marks		
		Theory	Tutorial	Lab	Credits	Internal	External	Total
THEORY								
A0521196	C# & .Net Framework	2	1	-	3	30	70	100
A0522196	Data Warehousing and Mining	2	1	-	3	30	70	100
A0523196	Android Programming	2	1	-	3	30	70	100
Professional Elective-I								
A0524196	Machine Learning	2	1	-	3	30	70	100
A0525196	Cloud Infrastructure and Service							
A0526196	Principles of Programming Languages							
A0527196	Image Processing							
Open Elective-I/ MOOCs								
A0528196	Agile Software Development	2	1	-	3	30	70	100
A0529196	Object Oriented Analysis and Design							
A0530196	Computer Graphics							
A0531196	Internet of Things (IoT)							
A0018194	Constitution of India (Mandatory Learning Course-III)	2	-	-	-	-	-	-
A0532196	Campus to Corporate (Skill Development Course-IV)	1	2	-	0.5	30	70	100
PRACTICALS								
A0585196	C# & .Net Framework Lab	-	-	3	1.5	25	50	75
A0586196	Android Programming Lab	-	-	3	1.5	25	50	75
A0082196	Mini Project - I	-	-	3	1.5	25	50	75
A0099196	Internship	-	-	-	1	-	-	-
A0081196	Comprehensive Viva - VI	-	-	-	0.5	-	50	50
Contact Periods / Week		13	7	9	21.5	255	620	875

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IV B. Tech I-Semester Course Structure

Subject Code	Name of the Subject	Hours/Week				Marks		
		Theory	Tutorial	Lab	Credits	Internal	External	Total
	THEORY							
A0537197	Software Testing Methodologies and Tools	2	1	-	3	30	70	100
	OPEN ELECTIVE-II							
A0538197 A0539197 A0540197	1) Human Computer Interaction 2) Cyber Security 3) Design Patterns	2	1	-	3	30	70	100
	PROFESSIONAL ELECTIVE-II							
A0536197 A0541197 A0542197	1) Artificial Intelligence 2) Big Data Analytics 3) Fog and Edge Computing	2	1	-	3	30	70	100
	PROFESSIONAL ELECTIVE-III							
A0543197 A0544197 A0545197	1) Linux System Administration 2) Advanced Computer Architecture 3) Distributed Systems	2	1	-	3	30	70	100
	PROFESSIONAL ELECTIVE-IV/MOOCs							
A0546197 A0547197 A0555197	1) Advanced Databases 2) R-Programming 3) Business Intelligence	2	1	-	3	30	70	100
	SKILL DEVELOPMENT COURSE-V							
A0548197	Block Chain Technology	1	2		0.5	30	70	100
	PRACTICALS							
A0587197	Software Testing Tools Lab	-	-	3	1.5	25	50	75
A0588197	Linux System Administration Lab	-	-	3	1.5	25	50	75
A0084197	Mini Project -II	-	-	3	1.5	25	50	75
A0083197	Project Phase-I	-	-	-	1.0	25	-	25
A0085197	Comprehensive Viva - VII	-	-	-	0.5	-	50	50
		11	7	9	21.5	280	620	900

IV B. Tech II-Semester Course Structure

Subject Code	Name of the Subject	Hours/Week				Marks		
		Theory	Tutorial	Lab	Credits	Internal	External	Total
	PROFESSIONAL ELECTIVE-V							
A0550198 A0551198 A0552198	1) Software Application Development using DevOps 2) Ethical Hacking 3) Multimedia and Application Development	2	1	-	3	30	70	100
	OPEN ELECTIVE-III							
A0026198 A0553198 A0023196	1) Management Science 2) Organizational Behavior 3) Business Environment	2	1	-	3	30	70	100
	SKILL DEVELOPMENT COURSE-VI							
A0554198	SCI Lab	1	2	-	0.5	30	70	100
A0088198	Comprehensive Viva -VIII	-	-	-	0.5	-	50	50
A0086198	Seminar	-	-	-	0.5	50	-	50
A0087198	Project Phase-II / Internship	-	-	-	8	25	100	125
		5	4	0	15.5	165	360	525

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I B.Tech, I-Sem (CSE)

L T C
1 1 2

(A0001191) COMMUNICATIVE ENGLISH- I

(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ Communicative English-I is prescribed to make students communicate their thoughts, opinions and ideas freely and in real life situations. It has been framed with basics of English usage covering LSRW (Listening, Reading, Speaking and Writing Skills) with suitable practice versions. Further, this course is designed to update the learner in relevant English skills to face campus recruitments and other competitive exams.

COURSE OUTCOMES:

- ❖ Develop speaking, reading skills by prescribed lesson. Understand basic grammar principles.
- ❖ Write effective letters for job application and complaints, Enhance reading comprehension.
- ❖ Comprehend English speech sound system, stress and Intonation, Understand the usage of Vocabulary.
- ❖ Enhance reading comprehension, Vocabulary, Speaking, Grammar.
- ❖ Acquire knowledge in writing skills, learn Grammar usage and interpret the poem.

MAPPING WITH COs & POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	2	3	-	-	-	-	1
CO2	-	-	-	-	-	2	3	-	-	-	-	1
CO3	-	-	-	-	-	3	2	-	-	-	-	1
CO4	-	-	-	-	-	3	2	-	-	-	-	1
CO5	-	-	-	-	-	2	3	-	-	-	-	1

UNIT-1

Speaking - Describing Home Towns - Hobbies - Reading - Essay - My Vision for India by APJ. Abdul Kalam, (<http://www.studypage.in>) Essay Writing Practice - Remedial Grammar - Practice - Standard Abbreviations & Acronyms

UNIT-2

Writing - Principles of Punctuation - Prewriting Techniques - Letter formats - Formal letter - Writing - Practice - Techniques of Spelling - Reading Comprehension Skills - Practice

UNIT-3

Listening & Speaking - Introduction to English Pronunciation - Minimal Pairs Practice - Words with complex pronunciation - Movie Analysis - Discussion - Grammar & Vocabulary - Concord - Idioms & Phrases - Practice

UNIT-4

Reading - Skimming and Scanning - What is a Drone: Main Features & Applications of Today's Drones by Jack Brown - Vocabulary - Computer Terminology - Phrasal Verbs - Speaking - Current Affairs - Discussions - Grammar & Usage - Articles & Prepositions - Practice.

UNIT-5

Writing: Structure of Paragraph Writing - Cause and Effect - Compare and Contrast -Practice - Techniques - Report writing - Official Reports - Business Reports - Practice -Grammar & Usage - Conditional sentences - IF Poem by Rudyard Kipling.

UNIT-6

Listening & Speaking - Indian English Variants - Difference between British and American English - Listening comprehensions - Test - Remedial Grammar - Correction of Sentences - Sentence Completions - Movie Analysis - Debate

REFERENCE TEXT BOOKS:

- 1) English Language & Communication Skills for Engineers (AICTE Syllabus) by Sanjay Kumar & Pushpa Latha, Oxford University Press, 2018
- 2) Practical English Usage by Michael Swan, Oxford University Press.
- 3) The Definitive Guide to IELTS Academic Writing, Oxford University Press, 2019.

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I B.Tech, I-Sem (CSE)

L	T	C
2	1	3

(A0002191) LINEAR ALGEBRA & CALCULUS

(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ The essential tool of matrices and linear algebra in a comprehensive manner.
- ❖ The fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems.
- ❖ To deal with functions of several variables that are essential in most branches of engineering.
- ❖ Apart from some other applications they will have a basic understanding of Beta and Gamma functions.
- ❖ The mathematical tools needed in evaluating multiple integrals and their usage

COURSE OUTCOMES:

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

- ❖ Understand the use of matrices and linear system of equations in solving problems such as Network analysis, encoding and decoding in Cryptography and Quantum mechanics problems.
- ❖ Apply the concept of Gamma and Beta functions linear digital signal processing, discrete Fourier transform, digital filters and Oscillatory theory in engineering.
- ❖ Analyze differential and integral calculus to solve improper integrals and its applications in many engineering disciplines.
- ❖ Determine the process to evaluate double and triple integrals and understand its usage to find surface area and volumes of various bodies in engineering.
- ❖ Identify the applications of advanced calculus & Linear algebra in electro-magnetic theory and in telecommunication engineering.

MAPPING WITH COs & POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	-
CO2	3	1	-	2	-	-	-	-	-	-	-	-
CO3	1	2	-	-	-	-	-	-	-	-	-	-
CO4	3	2	-	3	-	-	-	-	-	-	-	-
CO5	1	3	-	-	-	-	-	-	-	-	-	-

UNIT-1

Matrices: Elementary row transformations – Rank – Echelon form, Normal form – Solutions of Linear System of Homogenous and Non Homogeneous equations.

UNIT-2

Eigen Values, Eigen vectors – Properties; Cayley – Hamilton Theorem (without proof) – Inverse and Power of a matrix by Cayley – Hamilton theorem.

UNIT-3

Quadratic forms: Linear Transformation – Reduction of quadratic form to canonical form and their nature.

UNIT-4

Mean value theorems: Rolle's Theorem – Lagrange's Mean Value Theorem – (excluding proof). Taylor's and Maclaurin's Series for e^x , $\sin x$, $\cos x$ and $\log(1+x)$. Functions of several variables – Jacobian – Maxima and Minima of functions of two variables - Lagrange's method of Multipliers with three variables only.

UNIT-5

Special functions: Gamma function – Properties – Beta function – properties – Relation between Gamma and Beta functions – Evaluation of Integrals using Gamma & Beta functions.

UNIT-6

Multiple integrals: – Evaluation of Double integrals (Cartesian and Polar) – Change of Variables – Change of order of Integration – Evaluation of triple integrals.

TEXT BOOKS/REFERENCES:

- 1) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
- 2) Erwin kreyszig, Advanced Engineering Mathematics, 10th Edition, John Wiley & Sons, 2011.
- 3) Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
- 4) Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
- 5) T.K.V. Iyengar, B. Krishna Gandhi and Others, Mathematical Methods, S. Chand & Company.
- 6) T.K.V. Iyengar, B. Krishna Gandhi and Others, A Text Book of Engineering Mathematics, Vol – 1, S. Chand & Company.
- 7) S.R.K. Iyengar and R.K. Jain, Advanced Engineering Mathematics, Narosa publishing.

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY
AUTONOMOUS
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

I B.Tech, I-Sem (CSE)

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(A0005191) MODERN ENGINEERING CHEMISTRY
(For Branches EEE, ECE & CSE)

COURSE OBJECTIVES:

- ❖ To familiarize engineering chemistry and its applications
- ❖ To train the students on the principles and applications of electrochemistry and polymers
- ❖ To train the concepts of molecular structures and bonding
- ❖ To introduce the basic principles of spectroscopy and Supra molecules.

COURSE OUTCOMES:

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

- ❖ Concept of Ψ and Ψ^2 (L2)
- ❖ Compare the materials of construction for different types of batteries
- ❖ Explain the preparation, properties, and applications of thermoplastics, thermosetting & elastomers (L2)
- ❖ Understanding the principles of UV-Visible, IR and HPLC (L2)
- ❖ Applications of Supramolecular devices (L3)

MAPPING WITH COS & POS:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	1	-	-	-	1	1	-	-	1
CO2	-	1	2	1	-	1	1	-	-	-	-	-
CO3	1	-	-	2	-	-	1	1	-	-	-	-
CO4	1	3	-	1	2	1	-	1	-	-	-	1
CO5	1	1	-	1	2	-	-	1	1	-	-	1
Course	1	-	1	-	1	-	-	-	1	-	-	-

UNIT-1**Molecular Structure and Bonding:** (10 hrs)

Planck's quantum theory, dual nature of matter, Schrodinger equation, significance of Ψ and Ψ^2 , molecular orbital theory – bonding in homo and heteronuclear diatomic molecules – energy level diagrams of O₂, Calculation of bond order - Band theory of solids – Crystal field theory and its salient features – band diagrams for conductors, semiconductors and insulators, role of doping on band structures.

UNIT-2**Electrochemistry and Applications:** (10 hrs)

Types of Conductance – Conductance, Specific conductance, Equivalent Conductance and molar conductance. Determination of equivalent conductance by Wheatstone bridge method. Numerical Problems on conductance. Electrodes – concepts, reference electrodes (Standard hydrogen electrode and Calomel electrode) Nernst equation, cell potential calculations, concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations), photovoltaic cell – working and applications.

Primary cells – Daniell cell, Fuel cells- hydrogen-oxygen and their working. Secondary cells – lithium ion batteries.

UNIT-3**Polymer Technology:** (10 hrs)

Polymers: Classification of polymers, functionality, chain growth and step growth polymerization, Copolymerization with specific examples and mechanisms of additional polymerization.

Plastics - Thermoplastics and Thermosets, Preparation, properties and applications of – Bakelite, urea- formaldehyde, Nylon-6:6, Nylon 6, Nylon 11 and polyethylene.

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Rubbers: Natural Processing of Rubber, Vulcanization, preparation, properties and uses of Buna-S, Buna-N, Chloroprene.

UNIT-4**Advanced Engineering Material (8 hrs)**

Composites- Definition, Constituents, Classification- Particle, Fibre and Structural reinforced composites, properties and Engineering applications

Refractories- Classification, Properties and its Applications, Reasons for failure of the refractory materials

Nanoparticles: Introduction, preparation methods – Sol-gel method, Chemical reduction method –properties and applications in electronics.

UNIT-5**Fundamental aspects of Instrumental Methods (10 hrs)**

Electromagnetic spectrum, Absorption of radiation: Beer-Lambert's law. UV-Visible and IR.

Spectroscopies: Principle and Instrumentation and its applications. Chromatography: Principle and methods of Thin Layer Chromatography, separation of liquid mixtures of High Performance Liquid Chromatography (HPLC)

UNIT-6**Molecular Machines and Molecular Switches: (10 hrs)**

Concepts and terms of supra molecular chemistry, complementarity, Basic Lock and Key principle, examples of Supramolecules, Molecular recognition- cation binding, anion binding.

Applications of Supramolecular Devices- Ionic devices, Electronic devices, switching devices.

TEXT BOOKS:

- 1) Jain and Jain, Engineering Chemistry, 16/e, Dhanpat Rai, 2013.
- 2) Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

REFERENCE BOOKS:

- 1) K N Jayaveera, G V Subba Reddy and C Rama Chandraiah, Engineering Chemistry 1/e McGraw Hill Education (India) Pvt Ltd, New Delhi 2016
- 2) J. D. Lee, Concise Inorganic Chemistry, 5/e, Oxford University Press, 2008.
- 3) Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.
- 4) K Sesha Maheswaramma and Mridula Chugh, Engineering Chemistry Pearson India Education Services Pvt. Ltd
- 5) J.M.Lehn, Supra Molecular Chemistry, VCH Publications

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AUTONOMOUS
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

I B.Tech, I-Sem (CSE)

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(A0201191) PRINCIPLES OF ELECTRICAL ENGINEERING

COURSE OBJECTIVES:

The course will enable the students to:

- ❖ Get exposed to the basics in Electrical and Magnetic terms
- ❖ Get exposed to the basics in DC and AC circuits
- ❖ Briefing of Electrical machines fundamentals

COURSE OUTCOMES:

After completion of the course the students are expected to be able to

- ❖ To acquire the basic knowledge of different electrical quantities like voltage, potential difference, current, power, energy etc.,
- ❖ To analyze different kind of networks with their relevant equations analysis and get the electrical quantities and solutions to numerical problems (kvl, kcl, star-delta, mesh, nodal etc.)
- ❖ To acquire the basic knowledge on magnetic circuits like flux, mmf, reluctance, mutual and self inductances, coefficient of coupling.
- ❖ To analyze the single phase ac circuits.
- ❖ To understand the constructional features and operation of various devices like dc generator, motor, transformers and induction motor.
- ❖ To acquire the knowledge for solving the problems on dc generator, motor, transformer, induction motors.

MAPPING WITH COs & POs:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	-	1	-	-	-	1	-	-	1
CO2	3	3	3	-	3	-	-	-	2	2	-	1
CO3	2	2	-	-	-	-	-	-	1	-	-	1
CO4	3	2	1	-	2	-	-	-	1	1	-	1
CO5	3	2	1	-	-	-	-	-	2	1	-	1
CO6	2	3	2	-	2	-	-	-	2	1	-	1

UNIT-1**ELEMENTS OF ELECTRICAL CIRCUITS:**

Basic electrical terms: Charge-Voltage- Current- Power- Energy- Workdone

Basic elements: Resistor- inductor-capacitor-ideal voltage source-practical voltage source-ideal current source-practical current source-Energy stored in inductor and capacitor

Magnetic circuit terms and elements: Flux-reluctance-permeance – mmf – reluctance-comparison between electrical circuit and magnetic circuit-self inductance–mutual inductance-coefficient of coupling Problems on relations of basic terms in electric circuits and magnetic circuits

UNIT-2

DC CIRCUITS: Ohms law- KCL-KVL-Nodal analysis-mesh analysis-source transformation-resistors in series-parallel-Capacitors in series-parallel-Simple problems on dc circuits-Star to delta and delta to star transformation- simple problems.

UNIT-3

SINGLE PHASE AC CIRCUITS: Basic definitions-ac voltage source-time period-frequency-average value- RMS value-maximum value-form factor-peak factor-behavior of L and C – RL series and parallel- RC series and parallel- RLC series and parallel -P-Q-S-impedance triangle-power triangle- power factor-Introduction to three phase system-Simple problems

UNIT-4

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TRANSFORMER: Faradays laws of electromagnetic induction-types of induced emfs (statically, dynamically)-Lenzs law-principle of operation of transformer-types of transformers (core, shell)-derivation of EMF equation-transformation ratio-simple problems on emf equation

UNIT-5

DC MACHINES: Construction-principle of operation for Generator & Motor-emf equation -Types of DC Motors-Load & Speed Characteristics for DC Motor-O.C.C for DC Generator-Problems on EMF equation

UNIT-6

INDUCTION MOTORS: Construction-RMF-working principle-slip-effect of slip on rotor quantities-comparison between transformer and induction motor-simple problems

TEXT BOOKS:

1. Basic Electrical Engineering – 2nd Edition-T K Nagasarkar and M S Sukhija- Oxford University press- 2009.
2. Introduction to Electrical Engineering – 3rd Edition- M.S Naidu and S. Kamakshaiah- TMH publications -2007.
3. Principle of Electrical Engineering – 1st Edition- V.K.Mehta, Rohith Mehta- S.Chand publications- 2005.

REFERENCE BOOKS:

1. Basic Electrical Engineering-2nd Edition- Kothari and Nagarath- TMH Publications- 2013.
2. Electrical Machines – Vol-II- 23rd Edition- B.L.Theraja- S.Chand publications- 2005.
3. Engineering Circuit Analysis – 8th Edition- William Hayt and Jack E. Kemmerly-Mc Graw-Hill Companies-2017.
4. Network Analysis –3rd Edition-M.E Van Valkenberg- Prentice Hall India Learning Private Limited-1980.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

I B.Tech, I-Sem (CSE)

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(A0501191) PROGRAMMING FOR PROBLEM SOLVING-I

(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ To make students aware about fundamentals of computer programming.
- ❖ To provide exposure on C programming language
- ❖ To provide exposure on various C programming concepts like arrays, functions, pointers, Structures etc.
- ❖ To develop solutions for various problems by using C programming language.

COURSE OUTCOMES:

At the end of this course, the student would be able to

- ❖ Design algorithms and flowcharts for real world applications
- ❖ Know the usage of various operators in Program development
- ❖ Design programs involving decision and iteration structures.
- ❖ Apply the concepts code reusability using Functions
- ❖ Analyse the concepts of Arrays and Strings for real world problems.
- ❖ Able to apply the pointers in programs

MAPPING WITH COs & POs:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	3	-	2	-	-	-	2	1	-	-
CO2	2	-	-	-	2	-	-	-	-	-	-	-
CO3	3	2	3	2	-	2	-	-	2	-	-	-
CO4	3	-	2	-	-	-	-	-	3	-	-	-
CO5	-	3	3	-	-	2	-	-	-	-	2	-
CO6	-	-	3	-	-	-	2	-	-	-	-	-

UNIT-1

Problem Solving Using Computers: Introduction, Algorithms, Flowcharts and pseudo code.

Overview of C Language: Introduction, Salient Features of C Language, Structure of a “C” Program.

C Language Preliminaries: Keywords and Identifiers, Constants, Variables, Data Types, and Input Output Statements with suitable illustrative “C” Programs.

UNIT-2

Operators: Assignment Operators, Relational and Logical Operators, Increment and Decrement Operators, Bitwise Operators, Ternary Operator, Type Conversion, Precedence and Associativity with suitable illustrative C Programs.

UNIT-3

Statements in C: Conditional/Decision Statements: if, if-else, Nested if-else, else-if ladder, Switch-Statement and goto statement with suitable illustrative C Programs.

Loop Control Statements: while, do-while and for with suitable illustrative “C” Programs, break, continue statements.

UNIT-4

Arrays: Definition, Importance of an array in C language, One-Dimensional Arrays, Two-Dimensional Arrays, Example programs on the topics mentioned above.

Strings: Introduction to Strings, String I/O, String Operations with and without built-in functions

(strlen(), strcmp(), strcat(), strcpy(), and strrev()) Example Programs on the topics mentioned above

UNIT-5

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Functions: Introduction to Functions, benefits of functions, types of functions, Function calls, return vs. exit(), Parameter Passing mechanisms, Call-by-Value, Recursion, Storage Classes, preprocessor directives

UNIT-6

Pointers: Pointer variable and its importance, Pointer variable declaration, initialization of pointer variables, how to access a value from a memory location through it's pointer variable. Arithmetic operations on pointer variables, Scale factor length. Pointers and functions - pointers as function arguments (i.e., call-by-reference), Pointers and Arrays, Pointers and Strings, Generic Pointers.

TEXT BOOKS:

- 1) B.A.Forouzon and R.F. Gilberg, "COMPUTER SCIENCE: A Structured Programming Approach Using C", Third edition, CENGAGE Learning, 2016
- 2) Pradip Dey and ManasGhosh, Programming in C, Oxford University Press, 2nd Edition 2011.

REFERENCE BOOKS:

- 1) Byron Gottfried, "Programming with C ", Schaum's Outlines, 2nd Edition, TATA McGraw-Hill.
- 2) M.T.Somashekara, "Problem Solving Using C", PHI, 2nd Edition 2009.
- 3) A.K.Sharma, Computer Fundamentals and Programming in C, 2nd Edition, University Press
- 4) Rajaraman V., "The Fundamentals of Computers", 4th Edition, Prentice Hall of India, 2006.
- 5) R S Bichker, "Programming in C", University Press, 2012.

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I B.Tech, I-Sem (CSE)

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(A0091191) ENGINEERING CHEMISTRY LAB

(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVE:

- ❖ Verify the fundamental concepts with experiments

COURSE OUTCOMES:

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

- ❖ Learning the analytical skills while doing the experiments (L3)
- ❖ Learning the quality of water and its significance (L2)
- ❖ Importance of the Conductometric titrations while determine the strength of weak acids an coloured solutions (L3)
- ❖ Analyse the IR and UV-Visible Spectra of some organic compounds (L3)

MAPPING WITH COs & POs:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	-	1	-	-	-	-	1	-	-	1
CO2	-	2	1	-	2	1	1	1	-	-	1	-
CO3	-	1	-	-	1	-	1	-	1	-	-	1
CO4	1	3	2	1	2	-	1	-	-	-	1	1
Course	1	2	1	-	2	1	-	-	1	1		1

LIST OF EXPERIMENTS:

- 1) Preparation of standard $K_2Cr_2O_7$ solution
- 2) Estimation of Hardness of Water by using Standard EDTA solution
- 3) Estimation of Copper by using Standard EDTA solution
- 4) Estimation of Magnesium by using Standard EDTA solution
- 5) Estimation of dissolved oxygen by Winkler's method
- 6) Determination of Strength of given Hydrochloric Acid against standard sodium hydroxide solution by Conductometric titrations
- 7) Determination of Strength of given Acetic Acid against standard sodium hydroxide solution by Conductometric titrations
- 8) Determination of strength of mixture of acids against standard sodium hydroxide solution by conductometric method.
- 9) Verification of Beer-Lambert's law
- 10) Determine the strength of Cu(II) ion by colorimeter
- 11) Determination of total alkalinity of water
- 12) Preparation of a simple polymer
- 13) Thin layer chromatography
- 14) Identification of simple organic compounds by IR and UV-Visible Spectroscopy
- 15) HPLC method in separation of liquid mixtures

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

I B.Tech, I-Sem (CSE)

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(A0591191) PROGRAMMING FOR PROBLEM SOLVING LAB - I

(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OUTCOMES:

- ❖ To learn about different types of operators
- ❖ To learn how decision making is done during programming
- ❖ To learn about various simple constructs used for programming
- ❖ To learn to define functions and call them with appropriate parameters
- ❖ To understand the usage of string libraries to do common string operations
- ❖ To understand pointer referencing and pointer dereferencing

COURSE OUTCOMES:

At the end of this course, the student would be able to

- ❖ Apply the specification of syntax rules for numerical constants and variables, data types
- ❖ Know the Usage of various operators and other C constructs
- ❖ Design programs on decision and control constructs
- ❖ Develop programs on code reusability using functions
- ❖ Implement various concepts of arrays and strings

MAPPING WITH Cos & POs:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	2	-	-	-	-	-	-	-
CO2	2	-	-	-	3	-	-	-	-	-	-	-
CO3	-	3	3	-	-	-	-	-	-	-	-	-
CO4	3	-	2	-	-	-	-	-	-	1	2	-
CO5	-	2	-	-	2	-	2	-	-	-	-	1

RECOMMENDED SYSTEMS /SOFTWARE REQUIREMENTS:

- ❖ Intel based desktop PC with ANSI C Compiler and Supporting Editors

Write a C program to demonstrate the various operators used in C language.

Exercise-1

- a) Write a C program to find the roots of a quadratic equation.
- b) Write a C program to find both the largest and smallest number in a list of integers.

Exercise-2

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

Exercise-3

- a) Write a C program to find the sum of individual digits of a positive integer.
- b) Write a C program to generate the first 'n' terms of the Fibonacci sequence.
[Note: A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.]
- c) Write a C program to generate all the prime numbers between 1 and n, where 'n' value is given by the user.

[Note: Develop each of the above programs by using different loop constructs supported by C language. (i.e., while, do while and for Loops)]

Exercise-4

- a) Write a C Program to mask the most significant digit of the given number.
- b) Write a program which Prints the following pattern

0
111
22222
3333333
444444444

Exercise-5

- a) Write a C program to find all the even numbers in the given one dimensional array.
- b) Write a C program to print the elements of an array in reverse order.
- c) Write a C program to construct a pyramid of numbers.

Exercise-6

Write a C program to perform the following operations:

- a) Addition of Two Matrices
 - b) Multiplication of Two Matrices
- [Note: Use functions to implement the above specified operations]

Exercise-7

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

- a) To find the factorial of a given integer.
- b) To find the GCD (greatest common divisor) of two given integers.

Exercise-8

- a) Write a C Program to solve the Towers of Hanoi problem by using recursive function.
- b) Write a C Program to demonstrate the various storage classes, which are supported by the C language. [i.e., automatic, external, static and register]

Exercise-9

- a) Write a C Program to demonstrate that, how to pass an entire array as an argument to a function with a suitable example.
- b) Write a C Program to perform various operations on given two strings using string handling functions.

Exercise-10

- a) Write a C Program to perform various arithmetic operations on pointer variables.
- b) Write a C Program to demonstrate the following parameter passing mechanisms:
 - i) Call-by-value
 - ii) Call-by-reference

Exercise-11

- a) Write a C program that uses functions to perform the following operations:
 - i). To insert a sub-string in to a given main string from the specified position.
 - ii). To delete 'n' Characters from a given position in a given string.
- b) Write a C program to determine if the given string is a palindrome or not.

Exercise-12

- a) Write a C program that displays the position or index in the string 'S' where the string 'T' begins, or - 1 if 'S' doesn't contain 'T'.
- b) Write a C program to count the lines, words and characters in a given text.

REFERENCE BOOKS

- 1) Programming in C, Pradeep Dey, Manas Ghosh, Oxford Heigher Education
- 2) The Spirit of C, an introduction to modern programming, M.Cooper, Jaico Publishing House.
- 3) Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publications.
- 4) Computer Basics and C Programming, V. Raja Raman, PHI Publications.

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I B.Tech, I-Sem (CSE)

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(A0092191) DIGITAL ENGLISH LANGUAGE LAB

(For Branches: CE, EEE, Mech, ECE & CSE)

The Digital English Language Lab focuses on the production and practice of sounds of language and equips students with the use of English and vocabulary in everyday situations and contexts.

COURSE OBJECTIVES:

- ❖ To facilitate the students to use language effectively in everyday social conversations
- ❖ To expose the students to the blend of self-instructional and modes of language learning teacher assisted through digital lab
- ❖ To improve the fluency and intelligibility of student in spoken English and neutralize their mother tongue influences
- ❖ To help the students to participate in group discussions, to face interviews and shape the individual language learning.

COURSE OUTCOMES:

- ❖ Social interactions, greetings, self-introductions and group talk
- ❖ Improving standard pronunciation patterns and neutralize the mother tongue impact
- ❖ Developing communication through listening, reading, speaking and writing activities
- ❖ Enhancing vocabulary and grammar to develop professional language
- ❖ Improving life skills through GD and role plays practices

MAPPING WITH COs & POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	1	1	2	2	3	-	2
CO2	1	-	-	-	-	2	1	2	2	3	-	2
CO3	1	-	-	-	-	2	1	2	2	3	-	2
CO4	1	-	-	-	-	2	1	2	2	3	-	2
CO5	1	-	-	-	-	2	1	2	2	3	-	2

Digital English Language Lab consists of two parts:

- 1) CALL (Lab): Computer Assisted Language Learning
- 2) ICS (Lab): Interactivity Communication Skills

Exercise-1

Introduction to Phonetics - Speech Sounds - Vowels - Phonetic Transcription - CALL Lab - Ice Breaking Activity - Self Introductions (SWOT) - Social Interactions - Pair work - ICS Lab

Exercise-2

Diphthongs - Consonants - Phonetic Transcription - CALL Lab - Just A Minute (JAM) - ICS Lab

Exercise-3

Listening Comprehension (audio) - IELTS Testing Exercises - CALL Lab - Speaking Activity - Group talk - ICS Lab

Exercise-4

Vocabulary Building - Synonyms & Antonyms - Analogy - Testing Exercises - CALL Lab - Narration of a Story/Event/ Describing an Object - ICS Lab

Exercise-5

Situational Dialogues - CALL Lab - Role Play - ICS Lab

Exercise-6

Pronunciation Evaluation Testing Exercises through EPD - CALL Lab - Group Discussion - ICS Lab - Any student based activities

Course Outcomes:**Student will able to learn:**

- ❖ Will understand the spoken skills from CALL and ICS
- ❖ Will know the variations in accent of native and non-native speakers of English and achieve accent neutralization
- ❖ Will develop the reading & listening comprehension skills

PRESCRIBED SOFTWARE:

- K-VAN Solutions (licensed software)
 - Advance Communication Skills Lab
 - English Language Communication Skills Lab
- Cambridge Advanced Learners' English Dictionary with CD
- IELTS Academic Preparation and Practice with CD

BOOKS SUGGESTED FOR DELL: (CENTRAL LIBRARY)

- 1) Skill Pro – A Course in Communication Skills and Soft Skills by Prof. K. Sumakiran et.al, EMESCO.
- 2) Skill Pro-I Foundation Course - 4 - by Dr. G. Gulam Tariq et.al, Maruthi Publications.
- 3) Strengthen Your Steps – A Multimodal Course in Communication skills by Dr. M. Hari Prasad et.al
- 4) English Pronouncing Dictionary Daniel Jones Current Edition with CD
- 5) English Dictionary for Advanced Learners, (with CD) International edn. Macmillan 2009.

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I B.Tech, II-Sem (CSE)

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(A0006192) COMMUNICATIVE ENGLISH- II

(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ The course Communicative English - II is an extension of Communicative English - I. This will provide inputs in business vocabulary to introduce Communicative style in writing and speaking to expose students to professional scenario. This will lead students to write letters in professional contexts. Communicative English -II enhances the students' communication skills in terms of LSRW Skills.

COURSE OUTCOMES:

- ❖ Develop communicative competence by enunciating words and learn Language games.
- ❖ Build the habit of reading skills and enhance styles of writing.
- ❖ Interpret different accents and modulations through active listening and improvisation of writing skills.
- ❖ Write clear and coherent passages.
- ❖ Improve the ability to speak effectively in English in real life situations and understanding of Team Dynamics.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	2	3	-	-	-	1	2
CO2	-	-	-	-	-	3	2	-	2	-	3	1
CO3	-	-	-	-	-	2	3	-	2	-	1	1
CO4	-	-	-	-	-	2	3	-	2	-	1	1
CO5	-	-	-	-	-	2	3	-	2	-	2	1

UNIT-1

- a) Speaking - News Paper Reading - Narrating a Story/ Event
- b) Vocabulary Development: Root words-Homonyms-Homophones-Wordlists - Quizzes - Language Games – Puzzles

UNIT-2

- a) Reading Comprehension-Life is a Pizza by Richard Templar from Rules of Life - Vocabulary on Eateries, Food & Travel
- b) Business Writing - Memorandums - Letters - Style & Formats - E-mail Writing - Practice

UNIT-3

- a) Listening & Speaking - TED Talks - Listening Comprehension- Practice - Tests
- b) Writing - Proposals - Technical Paper Writing- Practice – Movie Analysis

UNIT-4

- a) Writing - Gadget Reviews - Technical Jargon - Resume Writing - Practice
- b) Précis Writing - Techniques of Writing the Précis- Sample Analysis-Practice.

UNIT-5

- a) Speaking - Seeking Information - Preferences - Likes & Dislikes - Cross - Cultural Communication
- b) Satya Nadella: When empathy is good for business <https://www.morningfuture.com> - Team Dynamics Activity

UNIT-6

- a) Listening & Writing - Movie/Short Film/Documentary Analysis
- b) Info Graphics- Techniques - Practice from IELTS Videos

REFERENCE TEXT BOOKS:

- 1) Word Power Made Easy by Norman Lewis, Goyal Publications
- 2) Group Dynamics for Teams 3rd Ed. By Levi, Daniel. Sage Publications India Pvt.Ltd. New Delhi, 2011.
- 3) Business English Essentials by Henderson, Greta Lafollette & Price R Voiles 7th Edition. Glencoe/McGraw Hill.
- 4) On Writing Well by William Zinsser, Harper Perennial Press, 2016

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I B.Tech, II-Sem (CSE)

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**(A0007192) ORDINARY, PARTIAL DIFFERENTIAL EQUATIONS & VECTOR
CALCULUS**

(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ The effective mathematical tools for the solutions of differential equations that model physical processes.
- ❖ To enlighten the learners in the concept of differential equations and multivariable calculus.
- ❖ To introduce the solution methodologies for second order Partial Differential Equations with applications in engineering
- ❖ To familiarize the concepts in vector calculus like gradient, divergent and curl, as well as, divergent theorems.

COURSE OUTCOMES:

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

- ❖ Obtain the knowledge of first and higher order differential equations and its use in solving Circuit analysis, heat transfer problems in engineering.
- ❖ Analyze solving higher order linear differential equations with variable coefficients and its applications.
- ❖ Understand about formation and solution of partial differential equations and importance in thermodynamics, continuum mechanics and fluid mechanics.
- ❖ Understand about vector differentiation and its applications in Electromagnetic theory.
- ❖ Apply the concept of vector integration to solve many problems in field theory, Electromagnetic theory and transmission lines.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	-	-	-	-	-	-	-	-	-
CO2	3	1	-	-	-	-	-	-	-	-	-	-
CO3	1	2	-	-	-	-	-	-	-	-	-	-
CO4	3	2	-	3	-	-	-	-	-	-	-	-
CO5	1	3	2	-	-	-	-	-	-	-	-	-

UNIT-1

Differential equations of first order and first degree - Formation of ODEs - Solution of ODEs - Exact, Non - Exact, Linear and Bernoulli's equations - Applications of ODEs to L - R & C - R circuits.

UNIT-2

Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type, e^{ax} , $\sin ax$, $\cos ax$, Polynomials in x , $e^{ax} V(x)$, $xV(x)$, Method of Variation of parameters.

UNIT-3

Higher Order linear Differential Equations with variable coefficients: Cauchy's and Legendre's linear Differential equations, simultaneous linear differential equations with constant coefficients.

UNIT-4**Partial Differential Equations of First order:**

First order partial differential equations, Formation of partial differential equations, solutions of first order linear and non – linear Partial differential equations, Method of separation of variables.

UNIT-5

Vector Differentiation: Introduction of Vector differentiation– Scalar and vector point functions – Gradient of scalar function– Directional derivatives – Divergence of a vector function – Curl of a vector function.

UNIT-6

Vector integration: Line integral - Potential function – Area, Surface and volume integrals. Vector integral theorems: Green's theorem (without proof) – Stoke's theorem (without proof) and Gauss Divergence Theorem (without proof); Verification of Green's, Stoke's and Gauss Theorems.

TEXT BOOKS/REFERENCES:

- 1) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
- 2) Erwin kreyszig, Advanced Engineering Mathematics, 10th Edition, John Wiley & Sons, 2011.
- 3) Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
- 4) T.K.V. Iyengar, B. Krishna Gandhi and Others, Mathematical Methods, S. Chand & Company.
- 5) T.K.V. Iyengar, B. Krishna Gandhi and Others, A Text Book of Engineering Mathematics, Vol – 1, S. Chand & Company.
- 6) S.R.K. Iyengar and R.K. Jain, Advanced Engineering Mathematics, Narosa publishing.
- 7) Ian Sneddon, Elements of Partial Differential equations, McGraw Hill.

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I B.Tech, II-Sem (CSE)

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(A0004191) APPLIED PHYSICS
(For Branches EEE, ECE & CSE)

COURSE OBJECTIVES:

- ❖ To provide basic concepts of optics, quantum physics, semiconductors and their applications to the engineering students.

COURSE OUTCOMES:

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

- ❖ Understand the concept of signals by studying the properties of light.
- ❖ Construct a quantum mechanical model to explain the behaviour of a system at the microscopic level.
- ❖ Analyse the structures of materials.
- ❖ Identify the semiconducting materials for a particular application.
- ❖ Design new optoelectronic devices for various applications.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	2	1	1	-	-	-	-	-	-	1
CO2	3	-	1	1	2	-	-	-	-	-	-	-
CO3	2	3	1	2	2	-	-	-	-	-	-	1
CO4	2	3	2	1	1	-	1	-	-	-	-	-
CO5	2	2	3	1	2	-	-	-	-	-	-	1

UNIT I: WAVE – OPTICS (9 Hours)

Interference: Introduction – Division of amplitude – Newton’s rings and its applications.

Diffraction: Introduction – Fraunhofer diffraction at single slit – Diffraction Grating – Grating spectra – Determination of wavelength of light.

Polarization: Introduction to polarization – Applications

UNIT II: QUANTUM MECHANICS (9 Hours)

Introduction to quantum physics – Wave-Particle duality – de Broglie hypothesis – Verification of wave character of Matter waves (Davisson–Germer experiment) – Uncertainty principle – Thought experiment (Electron diffraction) – Wave function (ψ) – Schrodinger’s one-dimensional time-independent wave equation – Particle in 1D-potential box.

UNIT III: QUANTUM OPTICS & FIBER OPTICS (9 Hours)

Lasers: Characteristics – Einstein’s coefficients – Radiation processes – Population inversion – Pumping processes Lasing action – Nd-YAG and He-Ne lasers – Engineering applications

Fiber Optics: Structure – Principle – Acceptance angle, Numerical aperture – Propagation of light in Step-index and Graded-index fibers – Applications: Fibre optic communication system (Block diagram) – Sensors.

UNIT IV: THE CRYSTAL STRUCTURE OF SOLIDS (9 Hours)

Introduction – Space lattice – Basis – Unit cell (primitive and Non-primitive) – Crystal systems – Bravais lattices – Atomic radius, Nearest neighbouring distance, Coordination number and packing factor for SC, BCC, FCC lattices – Diamond structure – Crystal planes and directions – Miller Indices – calculation of interplanar distance.

UNIT V: FREE ELECTRON THEORY & BAND STRUCTURE OF SOLIDS (9 Hours)

Introduction – Free electron theory – Sources of electrical resistivity – Fermi energy – Fermi level – Effect of temperature on Fermi distribution function – Kronig-Penny model (qualitative) – Energy bands – Effective mass – Classification of materials based on band theory.

UNIT VI: SEMICONDUCTOR PHYSICS & DEVICES (9 Hours)

Introduction – Intrinsic and Extrinsic semiconductors – Fermi level (qualitative) – Carrier generation and recombination – Carrier transport: Diffusion and Drift – Hall Effect and its applications – Direct and indirect band gap semiconductors – p-n junction, Band diagram and Working principle – Metal-semiconductor junction (Ohmic and Schottky) – LED – Photo detector – Solar cell.

TEXT BOOKS:

1. M. N. Avadhanulu, P.G. Kshirsagar & TVS Arun Murthy” A Text book of Engineering Physics”- S. Chand Publications, 11th Edition 2019.
2. R. K. Gaur and S.C. Gupta, “Engineering Physics”, Dhanpat Rai Publications, New Delhi.

REFERENCES:

1. “Concepts of Modern Physics”, Arthur Beiser Tata Mc Graw Hill Publications, New Delhi.
2. “Physics Volume – II”, Resnick, Halliday and Krane, Wiley, New Delhi.
3. “Elements of Solid State Physics”, J.P. Srivastava, PHI, 4th eds. New Delhi.
4. “Semiconductor Devices: Physics and Technology” S. M. Sze, 2nd eds. Wiley.
5. “Solid State Electronic Devices” Ben G. Streetman, Sanjay Kumar Banerjee, 6th eds. Phi Learning.
6. “Electronic Devices and Circuits”, 2nd eds. Reston Publishing Company, Inc., Reston, Virginia.
7. “Solid State Physics” R.K. Puri and V.K. Babber, S. Chand,

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I B.Tech, II-Sem (CSE)

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(A0301191) ENGINEERING DRAWING
(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ Increase ability to communicate with people
- ❖ Learn to take data and transform it into graphic drawings.
- ❖ Learn basic engineering drawing formats
- ❖ Prepare the student for future Engineering positions

COURSE OUTCOMES:

At the end of the course, the student will be able to:

- ❖ Understand the theory of orthographic projection.
- ❖ Understand the conventions and the methods adopted in engineering drawing.
- ❖ Know the importance of sectioning and Developments of solids in actual applications.
- ❖ Improve their visualization skills so that they can apply these skills in developing new products.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	3	-	-	-	-	-	2	-
CO2	3	2	3	2	3	-	-	-	-	-	-	-
CO3	3	2	2	1	3	-	-	-	-	-	-	1
CO4	3	2	2	2	3	-	-	-	-	-	1	-

UNIT-1

Polygons-Construction of Regular Polygons using given length of a side; Conic sections- Ellipse- Arcs of Circles and Oblong Methods, Construction of Parabola and Hyperbola by eccentricity method only.

UNIT-2

Introduction to Orthographic Projections- Projections of Points-Projections of Straight Lines parallel to both planes; Projections of Straight Lines-Parallel to one and inclined to other plane, inclined to both planes, determination of true lengths, angle of inclinations.

UNIT-3

Projections of Planes- Regular Planes Perpendicular / Parallel to one Reference, Plane and inclined to other Reference Plane.

UNIT-4

Projections of Solids-Prisms, pyramids, cones and Cylinders with the axis inclined to one Plane.

UNIT-5

Section of solids: Sectioning of prism, pyramid, cone and cylinder– sectional view – true shape. Solids in simple position and cutting plane inclined to one reference plane only.

Development of surface of solids: Development of truncated prism, pyramid, cone and cylinder – frustum of cone and pyramid

UNIT-6

Conversion of Isometric Views to Orthographic Views/Projections-Conversion of Orthographic Views to Isometric Projection/ Views.

TEXT BOOK:

- 1) Engineering Drawing by N.D. Bhatt, Chariot Publications.
- 2) Engineering Drawing and Graphics, Venugopal/New age publications.

REFERENCE BOOKS:

- 1) Engineering Drawing. K.L Narayana, P. Kanniah, Scitech Publications.
- 2) Engineering Drawing, B.V.R Gupta, J.K. Publishers.
- 3) Engineering Drawing by M.B. Shah and B.C. Rana, Pearson Publishers.
- 4) Engineering Drawing, Johle, Tata Mc Graw - Hill.
- 5) K.V. Natarajan, 'A text book of Engineering Graphics', Dhanalakshmi publishers, Chennai (2006).

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I B.Tech, II-Sem (CSE)

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(A0502192) PROGRAMMING FOR PROBLEM SOLVING - II

(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ To make students aware about structures and unions in C language.
- ❖ To provide exposure on various searching and sorting techniques.
- ❖ To provide exposure on various data structures like stacks, queues, circular queues and linked lists etc.,
- ❖ To develop solutions for various problems by using C Programming Language by students.

COURSE OUTCOMES:

At the end of this course, the student would be able to

- ❖ Develop programs with user defined data types.
- ❖ Apply various file handling techniques for better data management
- ❖ Apply stacks in various applications
- ❖ Apply queues in various applications and distinguish between stacks and queues.
- ❖ Analyze various dynamic data structures.
- ❖ Implement various searching and sorting techniques

MAPPING WITH COs & POs:

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	3	-	2	-	-	-	2	-	-	2
CO2	3	-	3	-	-	2	-	-	-	-	2	-
CO3	3	2	-	-	-	-	3	-	-	-	-	-
CO4	-	3	-	-	-	-	2	-	-	-	-	-
CO5	3	3	2	-	-	2	3	-	-	-	-	-
CO6	3	-	-	2	3	3	-	-	-	-	-	-

UNIT-1

STRUCTURE AND UNIONS IN C LANGUAGE: Structures – Introduction, Features of Structures. Declaration and Initialization of Structures, Accessing structure members, structure initialization. Nested Structures, Array of Structures, Arrays within structures and Pointers to Structures, Structures and Functions, Unions, typedef. Example Programs on the topics mentioned above.

UNIT-2

Files : Input and Output – Concept of a file, streams, text files and binary files, Differences between text and binary files, State of a file, Opening and Closing files, file input / output functions(standard library input / output functions for files), file status functions (error handling), Positioning functions, command –line arguments, C program examples.

UNIT-3

INTRODUCTION TO DATA STRUCTURES: Classification of data structures, dynamic memory allocation functions in C language. **Stacks:** Definition, Various representation methods, operations on stacks and their implementation in C language, applications of stacks.

UNIT-4

QUEUES: Definition, Various representation methods, operations on queues and their implementation in C language, applications of queues. Circular queues- operations on circular queues and their implementation in C language.

UNIT-5

LINKED LISTS: Definition, Various representation methods, operations on linked lists and their implementation in C language.

UNIT-6

SEARCHING AND SORTING TECHNIQUES: Searching Techniques - Linear search and Binary Search Techniques. Sorting techniques - Bubble Sort, Selection Sort, Insertion Sort. Implementation of all the above mentioned techniques in C language and trace them by giving different test data.

TEXT BOOKS:

- 1) B.A.Forouzon and R.F. Gilberg, "COMPUTER SCIENCE: A Structured Programming Approach Using C", Third edition, CENGAGE Learning, 2016
- 2) PradipDey and ManasGhosh, Programming in C, Oxford University Press, 2nd Edition 2011.

REFERENCE BOOKS:

- 1) Byron Gottfried, "Programming with C", Schaum's Outlines, 2nd Edition, TATA McGraw-Hill.
- 2) M.T.Somashekara, "Problem Solving Using C", PHI, 2nd Edition 2009.
- 3) A.K.Sharma, Computer Fundamentals and Programming in C, 2nd Edition, University Press
- 4) Rajaraman V., "The Fundamentals of Computers", 4th Edition, Prentice Hall of India, 2006.
- 5) R S Bichker, "Programming in C", University Press, 2012.

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I B.Tech, II-Sem (CSE)

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(A0094191) ENGINEERING PHYSICS LAB

(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ The laboratory should help the student to develop a broad array of basic skills and tools of experimental physics and data analysis.
- ❖ The laboratory should help students to understand the role of direct observation in physics and to distinguish inferences based on theory and the outcomes of experiments.
- ❖ To learn about the optical experiments in establishing the fundamentals in Interference and Diffraction phenomena which will be visualized with the light and laser experiments mentioned in the syllabus.
- ❖ To learn about the basic electronic experiments such as energy band gap determination, Hall Effect to know the type of extrinsic semiconductors, Stewart-Gee's experiment in field intensity determination and Solar I-V characteristics.

COURSE OUTCOMES:

After completion of the course the students will be able to

- ❖ Operate optical instruments like microscope and spectrometer.
- ❖ Determine thickness of a hair/paper with the concept of interference.
- ❖ Estimate the wavelength of different colors using diffraction grating.
- ❖ Measure the resolving power of the given optical device.
- ❖ Study the variation of intensity of the magnetic field due to circular coil carrying current with distance.
- ❖ Evaluate the acceptance angle of an optical fibre and numerical aperture.
- ❖ Calculate the band gap of the given semiconductor using four probe method.
- ❖ Identify the type of semiconductor (i.e., n-type or p-type) using Hall Effect.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	-	-	1	-	-	-	-	-	-	1
CO2	2	-	2	1	-	-	-	-	-	-	-	-
CO3	3	2	-	1	1	-	-	-	-	-	-	1
CO4	3	2	-	1	1	-	-	-	-	-	-	1

LIST OF EXPERIMENTS (ANY 10 EXPERIMENTS)

- 1) Determination of wavelength of light – Newton's rings
- 2) Determination of thickness of a thin film
- 3) Spectrometer – Transmission grating
- 4) Determination of wavelength of a Sodium light – Normal Incidence
- 5) Dispersive power of a prism - spectrometer
- 6) Laser experiment: wavelength determination using grating
- 7) Laser experiment: particle size determination
- 8) Determination of numerical aperture of an optical fiber
- 9) Field along the axis of coil carrying current – Stewart Gee's method
- 10) Determination of rigidity modulus – Torsional Pendulum
- 11) Determination of Band gap of Si or Ge – Four probe method
- 12) Study of B – H Curve.
- 13) Determination of Charge density and Hall coefficient or magnetic flux density – Hall effect.
- 14) Study of I-V characteristics of Solar Cell.
- 15) Measurement of Dielectric constant

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(A0593192) PROGRAMMING FOR PROBLEM SOLVING LAB - II

(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ To understand how to use structures and unions as a compound data types
- ❖ To understand various basic file operations
- ❖ To understand various stack and queue operations
- ❖ To understand various linked list operations
- ❖ To understand basic searching and sorting techniques

COURSE OUTCOMES:

At the end of this course, the student would be able to

- ❖ Develop applications on user defined data types
- ❖ Apply dynamic memory allocation through pointers
- ❖ Use different data structures for create/update basic data files
- ❖ Implement linear data structures through stacks and queues
- ❖ Implement various searching and sorting techniques, Linked lists.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	3	2	-	3	-	-	2	-	-	-
CO2	-	-	-	-	3	-	2	-	-	-	1	-
CO3	-	2	-	-	3	2	-	-	-	-	-	2
CO4	3	-	3	-	-	-	-	-	-	-	-	-
CO5	3	-	-	2	-	3	-	-	-	2	-	-

RECOMMENDED SYSTEMS /SOFTWARE REQUIREMENTS:

- ❖ Intel based desktop PC with ANSI C Compiler and Supporting Editors

Exercise-1

- a) Write a C Program to copy the contents of one structure variable to another structure variable.
- b) Write a C program to implement nested structure to store and display the student information. The structure student contains the field's S.no, name, and date. Date is the nested structure and it contains the fields day, month and year.

Exercise-2

- a) Write a C program to add two distances which is in feet and inches
- b) Write a C program to illustrate passing the whole structure as argument to a function.

Exercise-3

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

- a) Reading a complex number
- b) Writing a complex number
- c) Addition of two complex numbers
- d) Multiplication of two complex numbers (Note: represent complex number using a structure.)

Exercise-4

- a) Write a C program to implement Union Concept.
- b) Write a C program which copies last 'n' characters from one file to another.

Exercise-5

- a) Write a C program to reverse the first 'n' characters in a file.
- b) Write a C program to merge two files into a third file.

Exercise-6

Write a C program to implement the following operations on Stack using array representation

- a) Push

- b) Pop
- c) Display

Exercise-7

Write a C program to implement the following operations on Queue using array representation

- a) Insert
- b) Delete
- c) Display

Exercise-8

Write a C program to implement the following operations on Singly Linked list using linked representation

- a) Insert
- b) Delete
- c) Display
- d) Search

Exercise-9

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

- a) Bubble sort
- b) Selection sort
- c) Insertion sort

Exercise-10

Write C program to implement the following searching methods to search an element in a given list of integers

- a) Linear Search
- b) Binary Search

REFERENCE BOOKS:

- 1) Programming in C, Pradeep Dey, Manas Ghosh, Oxford Heigher Education
- 2) Computer programming and Data Structures, E.Balaguruswamy, Tata Mc Graw Hill. 2009 revised edition.
- 3) Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publications.

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(A0592191) ENGINEERING WORKSHOP AND IT WORKSHOP

(For Branches: CE, EEE, Mech, ECE & CSE)

ENGINEERING WORKSHOP

COURSE OBJECTIVES:

- ❖ To familiarize with the basic manufacturing processes and to study the various tools and equipment used, hands-on training is given in different sections. Essentially student should know the labour involved, machinery or equipment necessary, time required to fabricate and also should be able to estimate the cost of the product or job work.

COURSE OUTCOMES:

At the end of the Engineering Work Shop:

- ❖ A student should know the basic knowledge of various tools and their use in different sections of manufacturing such as fitting, carpentry, tin smithy, welding etc. and basic engineering practices such as plumbing, electrical wiring, electronic circuits, machine shop practice.
- ❖ Ability to design and model various basic prototypes in the trade of fitting such as Straight fit, V- fit.
- ❖ Ability to make various basic prototypes in the trade of Tin smithy such as rectangular tray, and open Cylinder.
- ❖ Ability to perform various basic House Wiring techniques such as connecting one lamp with one switch, connecting two lamps with one switch, connecting a fluorescent tube, Series wiring, Go down wiring.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	-	1	2	2	1	-	-	-	2	-	2	1	1	-	-	1
CO2	-	-	-	-	2	1	-	-	2	2	2	-	2	-	-	1
CO3	-	-	-	-	2	1	-	-	2	2	2	-	2	-	-	1
CO4	-	-	-	-	2	1	-	-	2	2	2	-	2	-	-	1

Note: At least two exercises to be done from each trade

1) TRADES FOR EXERCISES:

A] Carpentry

- 1) T-Lap Joint
- 2) Cross Lap Joint
- 3) Dovetail Joint
- 4) Mortise and Tennon Joint

B] Fitting

- 1) Vee Fit
- 2) Square Fit
- 3) Half Round Fit
- 4) Dovetail Fit

C] House Wiring

- 1) Parallel/Series Connection of two/three bulbs
- 2) Stair Case wiring
- 3) Tube Light Wiring
- 4) Measurement of Earth Resistance/Go down Wiring

D] Tin Smithy

- 1) Rectangular Tray
- 2) Square Box without lid
- 3) Open Scoop

4) Funnel

E] Welding

- 1) Single V butt joint
- 2) Lap joint
- 3) Double V butt joint
- 4) T fillet joint.

F] Soldering

- 1) Soldering & Disordering Practice
- 2) Series Circuit
- 3) Parallel Circuit

2) TRADES FOR DEMONSTRATION:

- a) Plumbing
- b) Machine Shop
- c) Bosch Power Tools

REFERENCE BOOKS:

- 1) Engineering Work shop practice for JNTU, V. Ramesh Babu, VRB Publishers Pvt. Ltd., 2009.
- 2) Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers.
- 3) Engineering Practices Lab Manual, Jeyapoovan, Saravana Pandian, 4/e Vikas.
- 4) Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House

IT WORKSHOP

COURSE OBJECTIVES:

- ❖ The modules include training on PC Hardware, and Productivity tools including text processor, spread sheet, presentation tools. It enables the students to understand and fix the common hardware, software issues & makes the students to install either Windows or UNIX based Operating system in the machines.
- ❖ Enable students to understand how computers work, different types of computers, functions of applications, input and data storage devices, different operating systems,
- ❖ It makes the students to understand and use the common office suite tools like word, excel etc. effectively in their daily usage.

COURSE OUTCOMES:

By the end of module students will be expected to demonstrate

- ❖ PC Hardware- introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer. The students should work on working PC to disassemble and assemble to working condition.
- ❖ To do installation of system software like MS Widows and Linux and the required device drivers.
- ❖ Productivity tools- module would enable the students in crafting professional word documents; excel spread sheets and power point presentations using the Microsoft suite of office tools.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	-	2	-	-	-	-	-	-	-	-
CO2	2	2	-	2	-	-	-	-	-	-	-	-
CO3	2	2	-	-	-	-	-	-	-	3	-	-
CO4	2	2	-	2	3	-	-	-	-	-	-	-

PC HARDWARE

Exercise 1 - Identify the peripherals of a computer, components in a CPU and its functions.

Exercise 2 - Every student should disassemble and assemble the PC back to working condition.

Exercise 3 - Every student should individually install MS windows on the personal computer and also install Linux as dual boot with both Windows and

OFFICE TOOLS

Exercise 4 - Word Orientation: The mentor needs to give an overview of LaTeX and Microsoft (MS) office equivalent tool word: Importance of LaTeX and MS office tool Word as word Processors, Details of the four tasks and features that would be covered in each. Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Task 1-Task III: Using Word Processor 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 Word.

SPREAD SHEET

Exercise 5 – Spread Sheet Orientation: The mentor needs to tell the importance of MS office 2007, 2010/ equivalent tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1-Task III: Features to be covered: - Gridlines, Format Cells, Summation, auto fill, Formatting Text, Formulas, Functions

PRESENTATION

Exercise 6 - Students will be working on basic presentation utilities and tools which help them create basic power point presentation. Topic covered during this Exercise includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in PowerPoint. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

REFERENCES:

- 1) Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
- 2) LaTeX Companion – Leslie Lamport, PHI/Pearson.
- 3) Introduction to Computers, Peter Norton, 6/e Mc Graw Hill
- 4) Upgrading and Repairing, PC's 18th e, 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.

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II B.Tech. I-Sem (CSE)

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(A0014193) PROBABILITY AND STATISTICS**COURSE OBJECTIVES:**

- ❖ To familiarize the students with the foundations of probability and Statistical methods
- ❖ To impart probability concepts and Statistical methods in various applications in Engineering.

COURSE OUTCOMES:

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

- ❖ Understand the basic probability concepts and random variables that have numerous applications in computer science.
- ❖ Apply the concept of distribution functions in web data and traffic network modelling in computer science engineering.
- ❖ Analyse statistics and its applications in simulation, data mining and reliability theory.
- ❖ Determine the process constructing linear and non-linear curves through the method of least square and understand its usage in binary mixtures.
- ❖ Identify the concept of statistical quality control in computer science and mechanical engineering.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	2	-	-	-	-	-	-	-
CO2	3	2	2	3	2	-	-	-	-	-	-	-
CO3	2	2	3	3	2	-	-	-	-	-	-	-
CO4	2	3	2	2	2	-	-	-	-	-	-	-
CO5	3	2	2	3	2	-	-	-	-	-	-	-

UNIT-1

Basic concept of probability – Random variables – Expectation – Discrete and continuous distributions.

UNIT-2

Distribution functions: Binomial Distribution – Poison Distribution and Normal Distribution – Related properties.

UNIT-3

Test of Hypothesis: population and sample – Confidence interval of mean from normal distribution – Statistical Hypothesis – Null and Alternative hypothesis- level of significance. Test of significance – Test based on normal distribution – Z test for means and proportions.

UNIT-4

Small samples – t – test for one sample and two sample problem, F – test and Chi – square test (Testing of goodness of fit and independence).

UNIT-5

Curve fitting: Fitting a straight line – Second degree curve – Exponential curve-Power curve by method of least squares.

UNIT-6**Correlation and Regression:**

Correlation: Rank correlation – Correlation Coefficient – Karl Pearson's Coefficient Correlation – Spearman Rank Correlation.

Regression: Regression lines – Standard Error of estimation – Classification of Regression techniques – Linear Regression (LR) Model.

TEXTBOOKS/REFERENCES:

- 1) Probability and Statistics, T.K.V. Iyengar, B. Krishna Gandhi and Others S. Chand & Company, 2012.
- 2) Higher Engineering Mathematics by B.S.Grewal, Khanna Publishers, 2010.

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- 3) Erwin kreyszig, Advanced Engineering Mathematics, 10th Edition, John Wiley & Sons, 2017.
- 4) Statistical methods by S.P.Gupta, S.Chand Publications, 2011.
- 5) Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2017.
- 6) Veerarajan T., Engineering Mathematics (for semester III), Tata McGraw-Hill, New Delhi, 2010.
- 7) <https://www.barnesandnoble.com/w/advanced-engineering-mathematics-kreyszig/1100520690>

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II B.Tech. I-Sem (CSE)

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(A0503193) PYTHON PROGRAMMING

(For branches CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

This course will enable students to

- ❖ Learn Syntax and Semantics of various Operators used in Python.
- ❖ Understand about Various Input, Output and Control flow statements of Python.
- ❖ Handle Strings and Files in Python.
- ❖ Understand Lists, Tuples in Python.
- ❖ Understand Sets, Dictionaries in Python.
- ❖ Understand Functions, Modules and Regular Expressions in Python.

COURSE OUTCOMES:

The students should be able to

- ❖ Examine Python syntax and semantics and be fluent in the use of various Operators of Python.
- ❖ Make use of flow control statements and Input / Output functions of Python.
- ❖ Demonstrate proficiency in handling Strings and File Systems.
- ❖ Create, run and manipulate Python Programs using core data structures like Lists and Tuples.
- ❖ Apply the core data structures like Sets and Dictionaries in Python Programming.
- ❖ Demonstrate the use of functions, modules and Regular Expressions in Python.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	1	-	-	-	1	1	1
CO2	2	3	-	-	-	-	-	-	1	-	-	-	1	1	1
CO3	1	-	2	-	-	-	-	-	1	-	-	-	1	1	1
CO4	2	-	2	-	-	-	-	-	1	-	-	-	1	1	1
CO5	2	-	2	-	-	-	-	-	1	-	-	-	1	1	1
CO6	2	-	2	-	-	-	-	-	1	-	-	-	1	1	1

UNIT-1

Introduction: History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation. Overview on data types: Numbers, Strings, Lists, Set, Tuple and Dictionaries.

Operators in Python: Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Shift Operators, Ternary operator, Membership Operators, Identity Operators, Expressions and order of evaluations. Illustrative examples on all the above operators.

UNIT-2

Input and Output statements: input() function, reading multiple values from the keyboard in a single line, print() function, 'sep' and 'end' attributes, Printing formatted string, replacement operator ({}). Illustrative examples on all the above topics.

Control flow statements: Conditional statements – if, if-else and if-elif-else statements. Iterative statements – for, while. Transfer statements – break, continue and pass. Illustrative examples on all the above topics.

UNIT-3

Strings: Introduction to strings, Defining and Accessing strings, **Operations on string** - String slicing, Mathematical Operators for String, Membership operators on string, Removing spaces from the string, Finding Substrings, Counting substring in the given String, Replacing a string with another string, Splitting of Strings, Joining of Strings, Changing case

of a String, Checking starting and ending part of the string, checking type of characters present in a string. Illustrative examples on all the above topics.

Files: Opening files, Text files and lines, Reading files, Searching through a file, Using try, except and open, Writing files, debugging.

UNIT-4

Lists: Creation of list objects, Accessing and traversing the elements of list. **Important functions of list** – len(), count(), index(), append(), insert(), extend(), remove(), pop(), reverse() and sort(). **Basic Operations on list:** Aliasing and Cloning of List objects, Mathematical Operators for list objects, Comparing list objects, Membership operators on list, Nested Lists, List Comprehensions. Illustrative examples on all the above topics.

Tuples: Creation of Tuple objects, Accessing elements of tuple, Mathematical operators for tuple, Important functions of Tuple – len(),count(),index(), sorted(), min(), max(), cmp(). Tuple Packing and Unpacking. Illustrative examples on all the above topics.

UNIT-5

Sets: Creation of set objects, Accessing the elements of set. Important functions of set – add(), update(), copy(), pop(),remove(),discard(),clear(). Basic Operations on set - Mathematical Operators for set objects, Membership operators on list, Set Comprehensions. Illustrative examples on all the above topics.

Dictionaries: Creation of Dictionary objects, Accessing elements of dictionary, Basic operations on Dictionary - Updating the Dictionary, Deleting the elements from Dictionary. Important functions of Dictionary – dict(), len(), clear(), get(), pop(), popitem(), keys(), values(), items(), copy(), setdefault(). Illustrative examples on all the above topics.

UNIT-6

Functions - Defining Functions, Calling Functions, Types of Arguments - Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful functions (Function Returning Values), Scope of the Variables in a Function - Global and Local Variables. Recursive functions, Illustrative examples on all the above topics.

Modules: Creating modules, **import** statement, from Import statement.

Regular Expressions: Character matching in regular expressions, Extracting data using regular expressions, Combining searching and extracting, Escape character.

TEXT BOOKS:

- 1) Python for Everybody: Exploring Data Using Python 3, 2017 Dr. Charles R. Severance

REFERENCE BOOKS:

- 1) Think Python, 2 Edition, 2017 Allen Downey, Green Tea Press
- 2) Core Python Programming, 2016 W.Chun, Pearson.
- 3) Introduction to Python, 2015 Kenneth A. Lambert, Cengages
- 4) https://www.w3schools.com/python/python_reference.asp
- 5) <https://www.python.org/doc/>

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II B.Tech. I-Sem (CSE)

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(A0410193) DIGITAL LOGIC DESIGN**COURSE OBJECTIVES:**

- ❖ Understand the different number system, its conversions and binary arithmetic.
- ❖ Know the fundamentals of Boolean algebra and theorems, Karnaugh maps including the minimization of logic functions to SOP or POS form.
- ❖ Analysis of logic circuits and optimization techniques to minimize gate count, signals, IC count, or time delay
- ❖ To strengthen the principles of logic design and use of simple memory devices, flip-flops, and sequential circuits.
- ❖ To fortify the documentation standards for logic designs, standard sequential devices, including counters and registers.
- ❖ To understand design of logic functions using PLDs (ROM, RAM, PAL, PLA).

COURSE OUTCOMES:

- ❖ Ability to differentiate between analog and digital representations.
- ❖ Ability to convert a number from one number system to its equivalent in of the other number system.
- ❖ Cite the advantages of the octal and hexa decimal number systems and to understand the difference between BCD and straightbinary.
- ❖ Ability to perform the three basic logic operations and construct the truth tables for the different types of gates. And Implement logic circuits using basic AND, OR and NOT gates.
- ❖ Ability to Use De-Morgan's theorem to simplify logic expressions and describe the concept of active LOW and active HIGH logic signals and Use Boolean algebra and K-map as tool to simplify and design logic circuits and Design simple logic circuits without the help of truth tables.
- ❖ Ability to Construct and analyze the operation of flip-flop and troubleshoot various types of flip-flop circuits.

MAPPING WITH COs & POs:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	1	-	2	-	-	-	-	-	-	2	-	2	1
CO2	-	1	-	-	-	-	-	-	-	-	-	-	2	1	1
CO3	1	1	-	-	-	2	-	-	-	-	-	-	3	2	1
CO4	-	2	3	2	-	-	-	-	-	-	-	-	1	1	2
CO5	-	1	-	-	-	-	-	-	-	-	-	-	2	1	-
CO6	1	-	-	3	2	2	-	-	-	-	-	2	1	1	-

UNIT-1

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

BOOLEAN ALGEBRA : Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions canonical and standard forms, other logic operations.

UNIT-2

LOGIC GATES AND GATE – LEVEL MINIMIZATION: Digital logic gates, and their integrated circuit numbers. The map method, Four-variable map, Five-Variable map, product of sums simplification Don't-care conditions, NAND and NOR implementation other Two-level implementations, Exclusive – OR function.

UNIT-3

COMBINATIONAL LOGIC: Combinational Circuits, Analysis procedure Design procedure, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, Introduction to HDL, VHDL code for basic and universal logic gates, Half adder ,full adder circuits.

UNIT-4

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

UNIT-5

ASYNCHRONOUS SEQUENTIAL LOGIC: Introduction, Analysis Procedure, Circuits with Latches, Design Procedure .Registers, shift Registers, Ripple counters synchronous counters other counters. Sequential Programmable Devices, VHDL code for Flip-flops, decade counter.

UNIT-6

PROGRAMMABLE LOGIC DEVICES: Introduction, Random-Access Memory, Memory Decoding, Error Detection and correction Read-only memory, Programmable logic Array, programmable Array logic, Sequential Programmable Devices.

TEXT BOOKS:

- 1) Digital Design –5 Edition, 2013, M.Morris Mano, Pearson Education/PHI.
- 2) Fundamentals of Logic Design, Roth, 7th Edition, 2020 Thomson.

REFERENCES:

- 1) Switching and Finite Automata Theory by Zvi. Kohavi, Tata McGraw Hill.
- 2) Switching and Logic Design, C.V.S. Rao, Pearson Education 2005.
- 3) Digital Principles and Design – Donald D.Givone, Tata McGraw Hill, 5 Edition, 2005.
- 4) Fundamentals of Digital Logic & Micro Computer Design, 5th Edition, 2005 M. Rafiquzzaman John Wiley.
- 5) <https://www.computer.org/csdl/journal/lt/2015/02/06897963/13rRUxE04q2>

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II B.Tech. I-Sem (CSE)

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(A0504193) MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE**COURSE OBJECTIVES:**

- ❖ To teach students notations used in the discrete mathematics associated with computer science and engineering.
- ❖ To teach the rudiments of elementary mathematical reasoning (elementary proofs; proofs by induction).
- ❖ To prepare students for the theoretical parts of all further courses in CSE.
- ❖ To study logic and Boolean algebra from a mathematical perspective, but relating it to computer engineering applications.
- ❖ To introduce basic set-theoretical notions: relations, functions, graphs, equivalence relations and orderings.
- ❖ To relate these notions to applications in CSE.

COURSE OUTCOMES:

- ❖ Understand the truth tables, the concept of logical equivalence, normal forms. And express English assertions in symbolic form and in predicate calculus using quantifiers.
- ❖ Gain knowledge on how to check validity of premises using different methods such as rule-cp, indirect method, and direct method.
- ❖ Know the basics of relations, functions and lattices.
- ❖ Perceive the Fundamentals of algebraic structures.
- ❖ Know the fundamentals of graph theory and traversing techniques of graphs.
- ❖ Know the applications of graphs such as Euler circuits, Hamiltonian graphs, Isomorphism, and Chromatic number

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	-	2	-	-	-	-	-	-	-	-	-	-
CO2	2	1	-	-	1	-	-	-	-	-	-	-	-	-	-
CO3	2	1	-	-	1	-	-	-	-	-	-	-	-	-	-
CO4	2	1	-	-	2	-	-	-	-	-	-	-	-	-	-
CO5	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-
CO6	2	1	-	-	1	-	-	-	-	-	-	-	-	-	-

UNIT-1

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

UNIT-2

Predicates: Rules of inference, Consistency, Predicate calculus: Free and bounded variable, Quantifiers: Universal Quantifiers, Existential Quantifiers.

UNIT-3

Relations: Relations, Properties of binary Relations, Types of relations: equivalence, compatibility and partial ordering relations, Hasse diagram. Lattices and its properties. Functions: introduction to Functions, types of functions

UNIT-4

Algebraic structures: Algebraic systems with examples and general properties, semi groups and monoids, groups & its types, Introduction to homomorphism and Isomorphism (Proof of theorems are not required)

UNIT-5

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

UNIT-6

Graph Theory and Applications: Directed Graphs, Graphs, Basic Concepts of Isomorphism and Sub graphs, walks and their classification, Multi graphs and Euler circuits, Hamiltonian graphs, Euler's formula & its applications, Chromatic Numbers.

TEXT BOOKS:

- 1) Discrete Mathematical Structures with applications to computer science Trembly J.P. & Manohar .P, TMH, 2017. **(unit-1 to 4)**
- 2) Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker Prentice Hall, 2008. **(unit-5 to 6)**

REFERENCES:

- 1) Mathematical foundations of computer science Dr D.S.Chandrasekharaiah Prism books Pvt Ltd, 2012.
- 2) Discrete Mathematics, R.K. Bisht, H.S. Dhami, Oxford, 7th Edition, 2012.

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II B.Tech. I-Sem (CSE)

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(A0505193) PROGRAMMING IN C++ AND DATA STRUCTURES

COURSE OBJECTIVES:

- ❖ This course explores fundamental data structures and the practical problems of implementing those structures in real programming languages and environments

COURSE OUTCOMES:

After the successful completion of this course, the students should:

- ❖ Differentiate between structure oriented programming and object oriented programming.
- ❖ Understand about Polymorphism and Inheritance
- ❖ Understand about the Exception Handling mechanism.
- ❖ Understand the linear data structures and Non-linear data structures.
- ❖ Understand the non-linear data structures like Binary search trees.
- ❖ Learn different Hashing techniques.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	1	-	-	-	1	1	1	1
CO2	2	1	-	-	-	1	-	-	-	-	-	-	1	2	1
CO3	-	-	1	-	-	1	-	-	-	-	-	-	1	2	1
CO4	-	-	-	1	-	1	-	-	-	-	-	-	1	2	2
CO5	2	-	-	1	-	-	-	-	-	-	-	-	1	1	2
CO6	2	-	-	-	-	-	-	-	-	-	-	1	1	1	2

UNIT-1

C++ Programming Elements, Classes and Objects, Constructors and Destructors, Static Class Members, Dynamic Memory Allocation (new and delete), Passing Parameter Methods, Inline Functions, Friend Functions.

UNIT-2

Inheritance in C++- Inheritance Types, Base class Access Control, Examples of Inheritance, Virtual Base Classes and Abstract Classes, Constructors in Derived Classes, Polymorphism - Types of Polymorphism, Function Overloading and Operator Overloading - Unary and Binary Operator Overloading.

UNIT-3

Virtual Functions and Pure Virtual Functions, Templates – Class Templates, Function Templates, Templates with Multiple Parameters, Member Function Templates, Overloading of Template Functions, Exception Handling – Exception Handling Mechanism, Throwing Mechanism, Catching Mechanism, Re-throwing an Exceptions and Specifying Exceptions.

UNIT-4

Overview of Data Structures, Implementation of Data Structures, Stack ADT, Queue ADT, List ADT, Circular Queue ADT, Priority Queue ADT, Double Linked List ADT and Implementation of ADT's using template classes in C++.

UNIT-5

Binary Search Trees, Definition, ADT, Operations- Searching, Insertion and Deletion.

UNIT-6

Dictionaries, operations insertion, deletion and searching hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing.

TEXT BOOKS:

- 1) Object Oriented Programming Through C++, E. Balaguruswamy,6 Edition, 2013.
- 2) Data Structures and algorithms: Concepts, Techniques and Applications G A V Pai, 2017.

REFERENCES:

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY
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- 1) Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) pvt.Ltd, 3rd edition 2013, Universities Press Orient Longman Pvt. Ltd.
- 2) Object Oriented Programming with C++, Sourav Sahay, Oxford 3 Edition, 2012.
- 3) Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and Mount, Wiley student edition, John Wiley and Sons, 2004.
- 4) Data structures and algorithms in C++, 3rd Edition, 2006, Adam Drozdek, Thomson.
- 5) Data structures using C and C++, 2rd Edition, 2006, Langsam, Augenstein and Tanenbaum, PHI.
- 6) <http://www.cplusplus.com/reference/>

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II B.Tech. I-Sem (CSE)

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(A0010193) BIOLOGY FOR ENGINEERS

(Life Sciences)

(For branches CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ To familiarize about biological components and their applications
- ❖ To train the students on the principles and Mechanisms in Biological Chemistry
- ❖ To train the concepts of molecular structures of Biomolecules
- ❖ To introduce the basic principles of Cell Structures and Functions
- ❖ To apply the concepts in the development of biosensors for mankind.

COURSE OUTCOMES:

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

- ❖ Explain concept and function of cell and cell organelles
- ❖ Develop knowledge about various physiological processes in biological systems
- ❖ Explain about biomolecules, their structure and function and their role in living organisms. How biomolecules are useful in industry.
- ❖ Understanding about human physiology
- ❖ Identify and describe the functions of the skeletal system

MAPPING WITH COs & POs:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO2	2	-	2	-	-	-	2	-	-	-	-	1	-	-	-
CO3	2	-	2	-	-	-	-	1	-	-	1	1	-	-	-
CO4	2	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO5	2	1	-	-	-	-	-	-	-	-	-	1	-	-	-
Course	1	-	1	-	1	-	-	-	1	-	-	-	-	-	-

UNIT-1:

Cell Structure and Function - Cell theory, Ultra structure of eukaryotic cell (Cell wall, Cell membrane, Golgi complex, Endoplasmic Reticulum, Peroxisome, Lysosomes), Semi-autonomous cell Organelles (Mitochondria & Chloroplast). (5 periods)

Learning outcomes:

- 1) Understand the structure and importance of the cell.
- 2) Explain the importance of eukaryotic cell.
- 3) Explain the functions of cell organelles.

UNIT-2:

Human Physiology – Nutrition (Functions of micro & macro nutrients and their role), Respiration (Definition, Types, Respiration in humans), Digestion (Process and digestive organs in humans), Excretion (Definition, Urinary system in humans). (6 Periods)

Learning outcomes:

- 1) Understand the metabolism in living organism.
- 2) Explain about the importance of human physiological process.
- 3) Identify the nutritional values in human body.

UNIT-3:

Biomolecules - Proteins (Denaturation of proteins), Nucleic acids (Mechanism of Replication & Transcription), Vitamins (Classification & functions of vitamins in bio-systems). (5 Periods)

Learning outcomes:

- 1) Describe the denaturation of proteins.
- 2) Illustrate replication of nucleic acids.
- 3) Identify the importance of Vitamins in human body.

UNIT-4:

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Biomaterials - Definition of biomaterials, Requirements of biomaterials, Classification of biomaterials, Physical and Mechanical properties of bio-materials, Comparison of properties of some common biomaterials. (5 Periods)

Learning outcomes

- 1) Understand the role of biomaterials for humans.
- 2) Understand the properties of biomaterials for organ substitution.

UNIT-5:

Skeletal System-Types of bones, Structure and composition of bone, artificial bone replacements with soft engineering materials. (6 Periods)

Learning outcomes

- 1) Understand bone structure and composition
- 2) Able to develop knowledge about bone replacement.

UNIT-6:

Applications of Biology- Stem Cells (Sources, Types and its Uses) Cancer Therapy, Basics of bio-sensors and bio-chips for bio-engineering. (5 Periods)

Learning outcomes

- 1) Understand the role of stem cells in biology.
- 2) Develop new type of biosensors, biochips etc.

TEXT BOOKS

- 1) Nelson, D. L. and Cox, M.M. (2008).Lehninger, Principles of Biochemistry, 5th Edition, W.H.Freeman and Company, N.Y., USA.
- 2) Ross & Wilson, Anatomy and Physiology, Churchill Livigstone publications (2014).

REFERENCE BOOKS

- 1) Voet, D. and Voet, J.G. (2004). Biochemistry, 3rd Edition, John Wiley & Sons, Inc. USA.
- 2) Karp, G. 2010. Cell and Molecular Biology: Concepts and Experiments. 6th Edition, John Wiley & Sons. Inc.
- 3) De Robertis, E. D. P. and De Robertis R. E. 2009. Cell and Molecular Biology, 8th edition. Lippincott Williams and Wilkins, Philadelphia.
- 4) Cooper G. M. Hausman R. E. 2009. The Cell: A Molecular Approach. 5th edition. ASM Press and Sunderland, Washington D. C.; Sinauer Academic Press.
- 5) L. Hench & E.C. Ethridge, Biomaterials – An Interfacial approach, Academic Press, 1982.

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II B.Tech. I-Sem (CSE)

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(A0011193) APTITUDE, ARITHMETIC, REASONING AND COMPREHENSION
(Skill Development Course-I)
(For Branches CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ To familiarize the students about the concepts of aptitude, arithmetic and reasoning
- ❖ To cope up the students to improve their employable skills

COURSE OUTCOMES:

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

- ❖ Understand number system which helps to become well trained for recruitment drives.
- ❖ Analyze permutations and combinations concept.
- ❖ Obtain the knowledge of coding and decoding concept.
- ❖ Understand the topics related to clock and probability.
- ❖ Identify the topics related to Venn diagrams, reasoning and Non-verbal reasoning.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	-	-	-	-	-	-	-	-	-
CO2	3	3	2	-	-	-	-	-	-	-	-	-
CO3	3	2	2	-	-	-	-	-	-	-	-	-
CO4	3	2	3	-	-	-	-	-	-	-	-	-
CO5	3	3	2	-	-	-	-	-	-	-	-	-

UNIT-1

Numbers, Number Systems Simple Equations, Ratio, Proportion, Variation Quadratic Equations, Progressions Percentages.

UNIT-2

Profit, Loss, Partnerships Averages, Mixtures & Allegations, Simple Interest, Compound Interest, Time and Work-Pipes, indices, surds, inequalities, Cisterns Time and Distance Geometry and Menstruation.

UNIT-3

Permutations & Combinations and Probability Data Interpretation & Data Sufficiency.

UNIT-4

Number & Letter Series, Analogies, Coding Decoding, Odd Man Out Blood Relations.

UNIT-5

Direction Sense, Symbols and Notations Deductions & Connectives Clocks, Calendars Analytical

UNIT-6

Reasoning (Verbal and Non-Verbal), Venn Diagrams, Analytical Puzzles and Octal number system.

REFERENCES:

- 1) R.S.Agarwal. Quantitative Techniques. S.Chand Series.
- 2) Shankuntala Devi. Techniques of Reasoning. S.Chand Series.
- 3) <https://www.fresherslive.com/online-test/verbal-ability-test/questions-and-answers>
- 4) <https://www.fresherslive.com/online-questions/verbal-ability-test/arithmetic-Reasoning>

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II B.Tech. I-Sem (CSE)

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(A0594193) PYTHON PROGRAMMING LAB

(For branches CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ To be able to introduce core programming basics and various Operators of Python programming language.
- ❖ To demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries
- ❖ To understand about Functions, Modules and Regular Expressions in Python Programming.

COURSE OUTCOMES:

- ❖ Student should be able to understand the basic concepts of scripting and the contributions of scripting language.
- ❖ Ability to explore python data structures like Lists, Tuples, Sets and dictionaries.
- ❖ Ability to create practical and contemporary applications using Functions, Modules and Regular Expressions.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	2	-	-	-	-	-	1	-	-	-	1	1	1
CO2	3	3	2	-	-	-	-	-	1	-	-	-	1	1	1
CO3	3	1	2	-	-	-	-	-	1	-	-	-	1	1	1

LIST OF PROGRAMMES

- 1) Program to demonstrate basic data type in python
- 2) Program to demonstrate operators in python
- 3) A cashier has currency notes of denominations 10, 50, and 100.If the amount to be withdrawn is input through the keyboard using input() function in hundreds, find the total number of currency notes of each denomination the cashier will have to give to the withdrawer
- 4) Program to demonstrate list and tuple in python
- 5) Write a program in Python, A library charges a fine for every book returned late. For first 5 days the fine is 50 paisa, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a program to accept the number of days the member is late to return the book and display the fine or the appropriate message
- 6) Write a program to calculate overtime pay of 10 employees. Overtime is paid at the rate of Rs.12.00 per hour for every hour worked above 40 hours. Assume that employee do not work for fractional part of an hour.
- 7) Two numbers are entered through the keyboard; write a program to find the value of one number raised to the power of another.
- 8) Write a function that receives marks received by a student in 3 subjects and returns the average and percentage of these marks. Call this function from main() and print the result in main
- 9) Write a program to read a file and display its contents.
- 10) Write a program to demonstrate Regular Expressions in python.

TEXT BOOKS:

1. Learning Python, Mark Lutz, Orielly, 3 Edition 2007.
2. Python Programming: A Modern Approach, Vamsi Kurama, Pearson, 2017.

REFERENCE BOOKS:

- 1) Think Python, 2 Edition, 2017 Allen Downey, Green Tea Press
- 2) Core Python Programming, 2016 W.Chun, Pearson.
- 3) Introduction to Python, 2015 Kenneth A. Lambert, Cengages
- 4) https://www.w3schools.com/python/python_reference.asp
- 5) <https://www.python.org/doc/>

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II B.Tech. I-Sem (CSE)

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(A0595193) PROGRAMMING IN C++ AND DATA STRUCTURES LAB**COURSE OBJECTIVES:**

- ❖ To make the student learn an object oriented way of solving problems.
- ❖ Learn how to implement some useful data structures.
- ❖ Understand the effect of data structures on an algorithm's complexity.
- ❖ To develop skills to design and analyze simple linear data structures
- ❖ To Strengthen the ability to identify and apply the suitable data structure for the given real world problem
- ❖ To Gain knowledge in practical applications of data structures

COURSE OUTCOMES:

- ❖ Basic ability to analyse algorithms and to determine algorithm correctness and time efficiency class.
- ❖ Design, write, execute, and debug programs in C++.
- ❖ At the end of this lab session, the student will
- ❖ Be able to design and analyze the time and space efficiency of the data structure
- ❖ Be capable to identify the appropriate data structure for given problem
- ❖ Have practical knowledge on the application of data structures

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	1	-	-	-	1	-	-	-
CO2	2	1	-	-	-	1	-	-	-	-	-	-	-	-	-
CO3	2	-	1	-	-	1	-	-	-	-	-	-	-	-	-
CO4	2	-	-	1	-	1	-	-	-	-	-	-	-	-	-
CO5	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-
CO6	2	-	-	-	-	-	-	-	-	-	-	1	-	-	-

WEEK 1:

Write C++ program that convert the given expression from Infix to prefix using templates.

WEEK 2:

Write a C++ program to evaluate the given Postfix expression.

WEEK 3:

Write C++ program that implement all the operations on Circular Queue with array representation with templates.

WEEK 4:

Write C++ program that implement all the operations on DE Queue with array representation with templates.

WEEK 5:

Write C++ programs to implement the following using an array representation with templates.

- a) Min Heap b) Max Heap

WEEK 6:

Write C++ programs to implement the following using an array representation with templates.

- a) Ascending Priority Queue b) Descending Priority Queue

WEEK 7:

Write C++ program to implement Doubly Linked List for all operations along with templates.

WEEK 8:

Write a C++ program to implement the following operations on Binary Tree

- a) Insert b) Delete c) Search d) Display

WEEK 9:

Write a C++ program to implement the following operations on Binary Search Tree

- a) Insert b) Delete c) Search d) Display

WEEK 10:

Write a C++ program to implement the following collision resolution techniques using templates.

- a) Linear Probing b) Quadratic Probing c) Double Hashing

TEXT BOOKS:

1. Object Oriented Programming Through C++, E. Balaguruswamy 6 Edition, 2013.
2. Data Structures using C++, Oxford, Varsha H. Patil.
3. Classic Data Structures, Debasis Samanta, PHI Learning Pvt Ltd, 2nd edition.
4. Data Structures and Algorithms in C++, Third Edition, 2006 Adam Drozdek, Thomson.
5. Data Structures using C++, D.S. Malik, Thomson

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II B.Tech. I-Sem (CSE)

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(A0496193) DIGITAL LOGIC DESIGN LAB**COURSE OBJECTIVES:**

- ❖ Know the fundamentals of Boolean algebra and theorems, Karnaugh maps including the minimization of logic functions to SOP or POS form.
- ❖ To strengthen the principles of logic design and use of simple memory devices, flip-flops, and sequential circuits.
- ❖ To fortify the documentation standards for logic designs, standard sequential devices, including counters and registers, combinational devices, includes decoder, multiplexer.

COURSE OUTCOMES:

- ❖ Ability to perform three basic logic operations and construct the truth tables for the different types of gates and implement logic circuits using basic AND, OR and NOT gates.
- ❖ Ability to use De-Morgan's theorem to simplify logic expressions and describe the concept of active LOW and active HIGH logic signals and use boolean algebra and K-map as tool to simplify and design logic circuits and Design simple logic circuits without the help of truth tables.
- ❖ Ability to Construct and analyze the operation of flip-flop and troubleshoot various types of flip-flop circuits, decoder, multiplexer.
- ❖ Analyze the operation of each IC in various logical systems.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	2	1	-	-	-	-	-	-	-	-	-	2	-	-
CO2	3	3	2	1	1	-	-	-	1	2	-	-	2	-	-
CO3	1	3	3	2	1	1	-	-	2	1	-	2	-	3	2
CO4	-	2	2	1	3	-	-	-	2	1	1	2	-	-	3

EXPERIMENTS

- 1) Basic Logic Gates AND,OR,NOT and their applications
- 2) Universal gates NAND and NOR
- 3) Study of combinational circuits 1 Half Adder and Full Adder
- 4) Study of combinational circuits 1 Half Subtractor and Full subtractor.
- 5) Study of Flip flops a) S-R F/F b) J-K F/F c) D-F/F d) T - F/F
- 6) Design of four bit ring counter using Flip Flop
- 7) 3 – bit synchronous counter using Flip Flop
- 8) 4-bit Johnson Ring counter using Flip Flop
- 9) MOD-5 Synchronous counter using F/F
- 10) 2-4 decoder
- 11) 4 to 1 Multiplexer
- 12) 3 – bit up/down counter using F/F

REFERENCES:

- 1) Digital Design –5 Edition, 2013, M.Morris Mano, Pearson Education/PHI.
- 2) Switching and Finite Automata Theory by Zvi. Kohavi, Tata McGraw Hill.

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II B.Tech. II-Sem (CSE)

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(A0507194) JAVA PROGRAMMING**COURSE OBJECTIVES:**

After taking this course, the student should be able to:

- ❖ To understand the concepts and features of object oriented programming.
- ❖ The skills to apply OOP in Java programming in problem solving
- ❖ To understand the concept of polymorphism and inheritance.
- ❖ To understand the creation of user defined packages and interfaces.
- ❖ To learn java's exception handling mechanism, multithreading,
- ❖ To learn the network programming implementation using java.

COURSE OUTCOMES:

- ❖ Students can able to understand the OOP concepts and java syntaxes.
- ❖ Students will Able Identify classes, objects, members of a class and relationships among them needed for a specific problem and understanding the Inheritance and polymorphism.
- ❖ Students Can Able to build directories and manage applications with interfaces.
- ❖ Able to develop java programs that manages input/output streams.
- ❖ Students can able to Write Java programs to implement error handling techniques using exception handling and multitasking.
- ❖ Students can able to Create and understanding of client/ server interactions.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	-	2	-	-	-	-	-	-	2	-	-	-
CO2	2	1	3	2	-	-	-	-	1	-	-	2	-	-	-
CO3	2	2	2	1	-	-	-	-	2	-	-	2	-	-	-
CO4	2	1	2	2	-	-	-	-	-	-	-	2	-	-	-
CO5	3	2	3	1	-	-	-	-	-	-	-	2	-	-	-
CO6	1	1	3	2	-	-	-	-	2	-	-	2	-	-	-

UNIT-1

Introduction To Java – Introduction to OOP, OOP Concepts, History of Java, Java buzzwords, How Java differs from C and C++, Structure of Java Program, data types, variables, constants, type conversion and casting, enumerated types, scope and life time of variables, operators, expressions , control statements, command line arguments , arrays.

UNIT-2

Introductions to Class and Objects: overview of classes, creations of objects, instant variables and methods, use of static, constructors, access control, usage of this, , overloading methods and constructors, garbage collection.

Inheritance – overview, Super and Sub classes, Member access rules, types of Inheritance, super uses, method overriding, Dynamic method dispatch, abstract classes and methods, use of final, the Object class and its methods.

UNIT-3

Interfaces – Interfaces vs. Abstract classes, defining interfaces, implementing and extending interfaces, allowing method definitions in interfaces (Java8).

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

UNIT-4

Input/Output exploring of java.io: The Java I/O Classes and Interfaces, File class, The Byte Streams and Character Streams, The Console Class, Using Stream I/O, Serialization

Strings: Strings, string functions,

UNIT-5

Exception handling: Fundamentals, exception types, usage of try, catch, throw, throws and finally, built in exceptions, creating your own exceptions subclasses.

Multithreading – overview, Main thread, creating threads, thread life cycle, creating multiple threads, use of isAlive() & join(), thread priorities, thread synchronization, interthread communication

UNIT-6

Collections Framework: Collections Overview, Collection Interfaces: Collection, List, Set, Sorted-Set, Collection Classes: Array-List, Linked-List, Hash-set, Linked-Hash-Set, Tree-Set Class. Accessing a Collection via Iterator, Sorting User-Defined Classes in Collections, Random Access Interface, working with Maps, Comparators, Collection Algorithms: Arrays, The Legacy classes and Interfaces: Enumeration, Vector, Stack, Dictionary, Hashtable, Properties, using store() and load().

TEXT BOOKS:

- 1) Java; the complete reference, 11th edition, 2018 Herbert Schildt, TMH.
- 2) Understanding OOP with Java, updated edition, T. Budd, Pearson Education.

REFERENCES:

- 1) An Introduction to programming and OO design using Java, 2015, J.Nino and F.A. Hosch, John Wiley & Sons.
- 2) Programming in Java, Sachin Malhotra, Saurabh Choudhary, 6 Edition, 2018.
- 3) An Introduction to OOP, 3rd edition, 2001, T. Budd, Pearson Education.
- 4) Introduction to Java programming 6th edition, Y. Daniel Liang, Pearson Education.
- 5) An introduction to Java programming and object oriented application development, R.A. Johnson- Thomson.
- 6) Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, seventh Edition, Pearson Education.
- 7) Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
- 8) <https://www.w3schools.com/JSREF/DEFAULT.ASP>
- 9) <https://dzone.com/articles/top-10-websites-advanced-level>

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II B.Tech. II-Sem (CSE)

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(A0508194) COMPUTER ORGANIZATION AND ARCHITECTURE

(For Branches EEE & CSE)

COURSE OBJECTIVES:

The Students will learn the following:

- ❖ To understand the structure, function, characteristics and performance issues of computer systems.
- ❖ To understand the design of the various functional units of digital computers.
- ❖ To understand the basic processing unit and how they are connected and how it generates control signals (using hardwired and micro programmed approaches).
- ❖ To understand the different types of memory and how they are related.
- ❖ To learn basics of Parallel Computing and Pipelining.

COURSE OUTCOMES:

Upon the successful completion of the course, the student will be able:

- ❖ Students will learn about computer performance, computer design, and trade-offs between cost and performance as well as between hardware and software.
- ❖ Students will formulate and solve problems, understand the performance requirements of systems.
- ❖ Students will learn to communicate effectively and learn to think creatively and critically, both independently and with others.
- ❖ Ability to design memory organization that uses banks for different word size operations.
- ❖ Students will learn about all the detailed design issues and circuits of each unit.
- ❖ Ability to conceptualize instruction level parallelism.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		1	3						2				2		1
CO2	2		2	3	1									3	
CO3	3	2	1	2									1		
CO4		2		1				1		2					2
CO5			3	2								1	2		
CO6					3						2	1		3	

UNIT-1

BASIC STRUCTURE OF COMPUTERS: Computer Types, Functional unit, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers.

DATA REPRESENTATION: Fixed Point Representation, Floating Point Representation. Error Detection codes.

UNIT-2

REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS: Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations

BASIC COMPUTER ORGANIZATION AND DESIGN: Instruction codes, Computer Registers, Computer instructions, Instruction cycle, Memory- reference instructions, Input – Output and Interrupt.

UNIT-3

CENTRAL PROCESSING UNIT: Stack organization, Instruction formats, Addressing modes, Data transfer and manipulation, Program control, Reduced Instruction set computer

COMPUTER ARITHMETIC: Fixed point operations - Addition and subtraction, multiplication, Division Algorithms

UNIT-4

THE MEMORY SYSTEM: Basic concepts, semiconductor RAM memories, Read-only memories, Cache memories, performance considerations

UNIT-5

PIPELINE AND VECTOR PROCESSING: Parallel processing, Arithmetic pipeline, Instruction Pipeline, RISC Pipeline, Vector processing, Array Processors.

UNIT-6

MULTI PROCESSORS: Characteristics of Multi Processors, Inter Connection Structures, Inter Processor Arbitration, Inter Processor Communication & Synchronization, Cache Coherence

TEXT BOOKS:

- 1) Computer Systems Architecture – M. Moris Mano, 10 Edition 2016, Pearson/PH
- 2) Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition 2011, McGraw Hill.

REFERENCES:

- 1) Computer Organization and Architecture–William Stallings Sixth Edition, 2012 Pearson/PHI
- 2) Dr. M. Usha, T. S. Srikanth, “Computer System Architecture and Organization”, First Edition, Wiley- India.
- 3) “Computer Organization” by ISRD Group, Tata McGraw-Hill
- 4) https://en.wikipedia.org/wiki/Computer_architecture
- 5) <https://onlinelibrary.wiley.com/doi/full/10.1002/9780470050118.ecse071>

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II B.Tech. II-Sem (CSE)

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(A0509194) FORMAL LANGUAGES AND AUTOMATA THEORY**COURSE OBJECTIVES:**

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

- ❖ Classify machines by their power to recognize languages.
- ❖ Employ finite state machines to solve problems in computing.
- ❖ Explain deterministic and non-deterministic machines.
- ❖ Comprehend the hierarchy of problems arising in the computer sciences.

COURSE OUTCOMES:

- ❖ To introduce the computer science students to the theoretical foundations of computer science.
- ❖ To study abstract models of information processing machines and limits of digital computation.
- ❖ To provide theoretical preparation for the study of programming languages and compilers.
- ❖ To design structural description of language statements.
- ❖ To develop the skills of formal and abstract reasoning as needed; for example, when designing, analysing, and / or verifying complex software/hardware systems.
- ❖ Be familiar with thinking analytically and intuitively for problem-solving situations in related areas of theory in computer science.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1		1				1	2		1		1		
CO2	1	1		1									1		1
CO3		2		1					1			1		2	
CO4		2		1					1		1	1	2		
CO5	1	1						1			1	1			
CO6		2							1					1	

UNIT-1

Automata: Why study Automata Theory: introduction to FA, Structural Representations, Automata and complexity.

The central concepts of Automata: Alphabet, Strings, Language and Operations.

Deterministic finite automaton: definition, How DFA processes Strings, Simpler notations for DFA's, extending the transition Function to Strings, The Language of a DFA and minimization of FSM.

UNIT-2

Non deterministic finite automaton: An informal view of NFA, Definition, The extended Transition Function, The language of an NFA, Equivalence of DFA and NFA.

Finite Automata with ϵ transitions: use of ϵ transitions, Notation, Epsilon closures, Eliminating ϵ Transitions: ϵ -NFA to DFA conversion.

Finite Automata with output: Moore and Melay machines.

UNIT-3

Regular Languages: Regular expressions, identity rules for regular expressions, Arden's Theorem.

Finite Automata and regular expressions: Converting a regular expression to a finite automata, Converting finite automata to a regular expression, Converting DFA's to Regular Expressions by Eliminating States (state elimination method), Converting finite automata to a regular expression using Algebraic method (using Arden's theorem), Equivalence of two finite automata. Pumping lemma of regular sets, Applications of pumping lemma, closure properties of regular sets (proofs not required).

UNIT-4

Context free grammar and Languages- Chomsky hierarchy of languages, Definition of CFG, Right most and leftmost derivations, The language of a grammar, Sentential Forms.

Regular grammars: construction of Regular grammar generating for a given DFA. Constructing a FA for given RG.

Parse Trees: Constructing Parse Trees, Application of CFG.

Ambiguity in grammars and Languages: Ambiguous grammars.

UNIT-5

Properties of CFL-Normal Forms for CFG: Eliminating Useless Symbols, Computing the generating and reachable symbols, Eliminating ϵ - productions, Eliminating unit productions, Chomsky normal form, Greibach normal form, Pumping Lemma for CFL and Closure properties of CFL (proofs are not required).

Push Down Automata- PDA: definition, model, graphical notation for PDA's, Instantaneous Descriptions of a PDA and The Language of a PDA.

UNIT-6

Introduction to Turing Machines-TM: notation for the Turing Machine, Instantaneous Descriptions for TM, Transition Diagrams for TM, The language of a TM.

Extensions to the basic TM: Multi-tape TM, NDTM, Restricted Turing machines: Multi-stack machines, Counter Machines. Universal Turing Machine, Church's thesis, Linear bounded automata and context sensitive languages, Undecidability, Recursive and recursively enumerable languages, Post's Correspondence Problem.

TEXT BOOKS:

- 1) "Introduction to Automata Theory Languages and Computation". John E. Hopcroft, Rajeev Motwani and Jeffery D. Ullman. Pearson Education – third edition 2008.
- 2) Formal Language and Automata Theory by KVN Sunitha ,Tata McGraw Hill Education 2010

REFERENCES:

- 1) "Theory of Computer Science (Automata languages and computation)" K. L. P. Mishra and N. Chandra Shekaran, 2nd edition, 2006 PHI. (UNIT II)
- 2) Theory of Computation, Vivek Kulkarni, Oxford, 7 Edition
- 3) Formal Languages and Automata Theory, C.K. Nagpal.
- 4) <https://www.oreilly.com/library/view/introduction-to-automata/9788131793510/xhtml/references.xhtml>
- 5) <https://www.ics.uci.edu/~goodrich/teach/cs162/notes/>

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II B.Tech. II-Sem (CSE)

L	T	C
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(A0510194) DESIGN AND ANALYSIS OF ALGORITHMS**COURSE OBJECTIVES:**

- ❖ To understand the significance of algorithms in the computer field.
- ❖ To understand the various aspects of algorithm development.
- ❖ To find the qualities of a good solution.
- ❖ To understand the significance and importance of program correctness.
- ❖ To understand the relationship between algorithms and other fields in the computer realm.
- ❖ To understand the significance of algorithm efficiency.

COURSE OUTCOMES:

- ❖ Students will be able to demonstrate the performance of algorithm and represent time complexity.
- ❖ Students will understand to design the efficient algorithms using Divide and Conquer algorithm design technique.
- ❖ Students will demonstrate a number of standard algorithms for problems using Greedy method.
- ❖ Students will be able to understand the Dynamic Programming algorithm design strategies and solve the problem using this technique.
- ❖ Students will learn the Backtracking design strategies.
- ❖ Students will be able to understand the Distinguish between P and NP Problems.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1		2				2	2					
CO2	2	3			2				2	2					
CO3	2	3			2				2	2					
CO4	2	3			2				2	2					
CO5	2	3			2					2					
CO6	2	2			2				2	1					

UNIT-1

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis- Space complexity, Time complexity, Asymptotic Notation- Big oh, Omega, Theta notation and Little oh notation, Disjoint Sets- disjoint set operations, union and find algorithms.

UNIT-2

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

UNIT-3

Greedy method: General method, applications-Job sequencing with deadlines, knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT-4

Dynamic Programming: General method, applications- 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design, optimal binary search tree.

UNIT-5

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

UNIT-6

NP-Hard and NP-Complete problems: Basic Concepts, Non Deterministic algorithms, the classes of NP Hard and NP Complete, Cook's Theorem.

TEXT BOOKS:

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- 1) Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, 2015 Galgotia publications pvt. Ltd.
- 2) Algorithm Design: Foundations, Analysis and Internet examples, M.T.Goodrich and R.Tomassia, 2006 John wiley and sons.

REFERENCES:

- 1) Introduction to Algorithms, second edition, T.H.Cormen, C.E.Leiserson, R.L.Rivest and C.Stein, PHI Pvt. Ltd. Pearson Education.
- 2) Design and Analysis of algorithms, S. Sridhar, Oxford, 2014.
- 3) Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.
- 4) Algorithms – Richard Johnson baugh and Marcus Schaefer, Pearson Education.
- 5) <https://www2.cs.duke.edu/courses/fall08/cps230/Book.pdf>
- 6) <http://www.personal.kent.edu/~rmuhamma/Algorithms/algorithm.html>

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II B.Tech. II-Sem (CSE)

L	T	C
2	1	3

(A0511194) DATABASE MANAGEMENT SYSTEMS

(For Branches: EEE & CSE)

COURSE OBJECTIVES:

- ❖ Advantages applications of DBMS and Database system structure.
- ❖ Schema design: ER model and conceptual design.
- ❖ Relational Model, Formal Query Languages and SQL basis.
- ❖ Storage and efficient retrieval of data: various indexing techniques.
- ❖ Schema refinement: normalization and redundancy removal and functional dependant.
- ❖ Transaction management: locking protocols, serializability concepts etc.

COURSE OUTCOMES:

- ❖ Students will learn about the need for DBMS, applications and its structure.
- ❖ Students will learn about storage and efficient retrieval of large Information, constraints and formal query languages.
- ❖ Students will also learn basics of SQL, primary key, foreign key concepts and triggers.
- ❖ Students will learn about functional dependency and the need for schema refinement (normalization) to remove redundancy of data.
- ❖ Students will also learn about transaction management concurrency Control.
- ❖ Students will learn about various storage and indexing methods and RAID concepts.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1		3										2		
CO2	1			3				2						2	3
CO3		2								1	1		1		
CO4							2								2
CO5			2				2							1	

UNIT-1

Database System Applications, database System VS file System – View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model – Database Languages – DDL – DML – Database Access for applications Programs – Database Users and Administrator – Transaction Management – Database System Structure – Storage Manager – the Query Processor- Data base design and ER diagrams – Beyond ER Design- Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Conceptual Design with the ER Model.

UNIT-2

Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical database Design – Introduction to Views – Destroying /altering Tables and Views. Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra queries – Relational calculus – Tuple relational Calculus – Domain relational calculus.

UNIT-3

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

UNIT-4

Schema refinement – Problems Caused by redundancy – Decompositions – Problems related to decomposition – Functional dependencies-reasoning about FDS – FIRST, SECOND,

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THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form.

UNIT-5

Overview Of Transaction Management: The ACID Properties, Transactions and Schedules, Concurrent Execution of transactions-Lock Based Concurrency Control, Performance of Locking, Transaction Support in SQL.

Concurrency Control: 2PL, Serializability and recoverability, Introduction Lock Management, Lock Conversions, Dealing with Deadlocks, Concurrency control without locking.

UNIT-6

Data on External Storage – File Organizations and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – The Memory Hierarchy, RAID, Disk Space Management, Buffer Manager, Files of Records, Page Formats, record Formats.

TEXT BOOKS:

- 1) Data base Management Systems, Raghu Ramakrishna, Johannes Gehrke, TATA McGraw Hill 3rd Edition 2017
- 2) Data base System Concepts, Silberschatz, Korth, McGraw hill, 6 edition, 2013.

REFERENCES:

- 1) Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 11th Edition, 2016.
- 2) Fundamentals of Database Systems, ElmasriNavathe Pearson Education.
- 3) Introduction to Database Systems, C.J.Date Pearson Education.
- 4) <https://www.oreilly.com/library/view/concepts-of-database/9789332537422/xhtml/bibliography.xhtml>
- 5) <https://en.wikipedia.org/wiki/Database>
- 6) <https://www.sanfoundry.com/best-reference-books-database-management-systems/>

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II B.Tech. II-Sem (CSE)	L	T	C
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(A0017194) INDIAN HERITAGE AND CULTURE

(Mandatory Learning Course-I)

(For branches CE, EEE, Mech, ECE & CSE)

INTRODUCTION:

- ❖ Indian Heritage is an ancient facet pertaining to bygone ages. It reflects strong ethical culture and embodiment of nature in life style. It had its deep roots in great Indian epics and Upanishads. It has been transformed and strengthened by many kings and queens. It is received by erudite writers. The glory of Indian Heritage & culture have been ignored or distorted in wake of western culture. The present generation ought to know their indigenous culture and heritage.

COURSE OBJECTIVES:

- ❖ To enable the students to have an insight into and understanding of the great heritage and culture of India.
- ❖ To sensitize them towards preservation and progression of the same.

COURSE OUTCOMES:

- ❖ Equip themselves with knowledge about the heritage and culture of India.
- ❖ Apply the ancient wisdom to become successful professionals.

UNIT-1

Origin of Indian Culture - Indus valley & Vedic Culture Evolution - Political unification of India under Mauryas and Guptas - Cultural achievements - Cultural conditions under the Sathavahanas - Contribution of Pallavas and Cholas to art and letters.

UNIT-2

Influence of Islam on Indian Culture - The Sufi, Bhakti and Vishnavite Movements - Cultural achievements of Vijayanagara rulers - Contribution of Shershah and Akbar to the evolution of administrative system in India - Cultural Developments under Mughals - Great Indian Monuments.

UNIT-3

Great Indian Epics - Ramayana and Mahabharata - Upanishads - Vedas - Pathanjali - Yoga - Principles of Jainism and Buddhism.

UNIT-4

Indian Literature - Rabindranath Tagore - Arundhati Roy - RK.Narayan - Sri Sri - Gurajada -Jashuva - Western Impact on India - Introduction of Western Education - End of the Gurukulas educational system.

UNIT-5

Social and Cultural awakening and social reform movements - Raja Rama Mohan Roy - Dayananda Saraswathi -Theosophical Society - Ramakrishna Paramahansa and Vivekananda - Iswara Chandra Vidyasagar and Kandukuri Veeresalingam - Emancipation of women and struggle against Caste.

UNIT-6

Mahatma Gandhi - Non-violence and Satyagraha - Great leaders of Freedom struggle - Post Independent Era.

TEXT BOOK

- 1) Madanlal Malpani & Shamsunder Malpani (2016), *Indian Heritage and Culture*, New Delhi: Kalyani Publishers.

REFERENCE BOOKS

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY
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- 1) Romila Thapar (2018), Indian Cultures as Heritage: Contemporary Pasts, India.
- 2) Anurag Mathur (2017), Indian Culture & Heritage, Create space independent publishing Platform, 2017.
- 3) P.R.Rao & P. Raghavendra, Indian Heritage and culture, Sterling Publication Pvt. Ltd.
- 4) Madhukar kumar Bhagat, Indian Heritage and culture, Access Publications.
- 5) Dhirendra Singh, Indian Heritage and culture, APH Publications.
- 6) <http://www.indiaculture.nic.in/>
- 7) <http://www.indiaculture.nic.in/world-heritage>

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II B.Tech. II-Sem (CSE)

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(A0016194) DESIGN THINKING FOR INNOVATIONS

(Skill Development Course-II)

(Common to CE, Mech, EEE, ECE & CSE)

COURSE PRE-REQUISITES: None

COURSE OBJECTIVES:

- ❖ To create awareness of design thinking among students of engineering
- ❖ To teach a systematic approach to identifying and defining a problem before brainstorming for a solution
- ❖ To instil a sense of significance towards applying creativity to product and service design
- ❖ To motivate students to apply design thinking while implementing a project focusing on local or global societal problems

COURSE OUTCOMES:

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

- ❖ Identify design principles from an engineering perspective.
- ❖ Cultivate sensitivity towards design aspects of Activities, Environments, Interactions, Objects, and Users (A-E-I-O-U) in daily life.
- ❖ Validate problem statements through user empathisation with societal and environmental consciousness.
- ❖ Devise visual design and documentation to communicate more effectively.
- ❖ Develop project management skills in a multidisciplinary environment

STUDENTS' RESPONSIBILITIES:

1. Forming diverse teams of 3–5 members each to work collaboratively throughout the semester.
2. Proactively engaging to observe the objects and interactions in their daily life and society from a design perspective.
3. Identifying general societal and social problems that may be effectively addressed using design thinking principles
4. Presenting and reporting the tasks to the concerned faculty members using their creative communication and people skills.

UNIT-1:**Design Thinking Overview and Motivation**

Introduction, What is Design thinking, Why design, Design is Everywhere, – Various perspectives, Four principles of successful innovation, A model of design Innovation process, Seven Modes of the Design Innovation Process, Understanding. Design Engineering vs. Engineering Design

UNIT-2:**Sense Intent and Know Context**

Sense Intent: Mindsets, Sensing Changing Conditions, Seeing Overviews, Foreseeing Trends, Reframing Problems, Forming an Intent. Methods: Buzz Reports, Popular Media Scan, Key Facts, Innovation Sourcebook, Trends Expert Interview, Keyword Bibliometrics, Ten Types of Innovation Framework, Innovation Landscape, Trends Matrix, Convergence Map, From...To Exploration, Initial Opportunity Map, Offering-Activity-Culture Map, Intent Statement

Know Context: Mindsets, Knowing Context History, Understanding Frontiers, Seeing System Overviews, Understanding Stakeholders, Using Mental Models, Know Context: Methods, Contextual Research Plan, Popular Media Search, Publications Research, Eras Map, Innovation Evolution Map, Financial Profile, Analogous Models, Competitors-

Complementors Map, Ten Types of Innovation Diagnostics, Industry Diagnostics, SWOT Analysis, Subject Matter Experts Interview, Interest Groups Discussion.

UNIT-3:**Know People & Frame Insights**

Know People: Mindsets, Observing Everything, Building Empathy, Immersing in Daily Life, Listening Openly, Looking for Problems and Needs, Know People: Methods, Research Participant Map, Research Planning Survey, User Research Plan, Five Human Factors, POEMS, Field Visit, Video Ethnography, Ethnographic Interview, User Pictures Interview, Cultural Artifacts, Image Sorting, Experience Simulation, Field Activity, Remote Research, User Observations Database,

Frame Insights: Mindsets, Exploring Systems, Looking for Patterns, Constructing Overviews, Identifying Opportunities, Developing Guiding Principles, Frame Insights: Methods, Observations to Insights, Insights Sorting, User Observation Database Queries, User Response Analysis, ERAF Systems Diagram, Descriptive Value Web, Entities Position Map, Venn Diagramming, Tree/Semi-Lattice Diagramming, Symmetric Clustering Matrix, Asymmetric Clustering Matrix, Activity Network, Insights Clustering Matrix, Semantic Profile, User Groups Definition, Compelling Experience Map, User Journey Map, Summary Framework, Design Principles Generation, Analysis Workshop

UNIT-4:**Explore Concepts**

Explore Concepts: Mindsets, Challenging Assumptions, Standing in the Future, Exploring Concepts at the Fringes, Seeking Clearly Added Value, Narrating Stories about the Future, Explore Concepts: Methods, Principles to Opportunities, Opportunity Mind Map, Value Hypothesis, Persona Definition, Ideation Session, Concept-Generating Matrix, Concept Metaphors and Analogies, Role-Play Ideation, Ideation Game, Puppet Scenario, Behavioral Prototype, Concept Prototype, Concept Sketch, Concept Scenarios, Concept Sorting, Concept Grouping Matrix, Concept Catalog.

UNIT-5:**Frame Solutions**

Frame Solutions: Mindsets, Conceiving Holistic Solutions, Conceiving Options, Making Value Judgments, Envisioning Scenarios, Structuring Solutions, Frame Solutions: Methods, Morphological Synthesis, Concept Evaluation, Prescriptive Value Web, Concept-Linking Map, Foresight Scenario, Solution Diagramming, Solution Storyboard, Solution Enactment, Solution Prototype, Solution Evaluation, Solution Roadmap, Solution Database, Synthesis Workshop

UNIT-6:**Realize Offerings**

Realize Offerings: Mindsets, Reiterating Prototypes, Evaluating in Reality, Defining strategies, Implementing in Reality, Communicating Vision, Realize Offerings: Methods, Strategy Roadmap, Platform Plan, Strategy Plan Workshop, Pilot Development and Testing, Implementation Plan, Competencies Plan, Team Formation Plan, Vision Statement, Innovation Brief

TEXT BOOKS:

1. Vijay Kumar, "101 Design Methods: A Structured Approach for Driving Innovation in Your Organization", John Wiley & Sons (2012) (ISBN: 978-1118083468)
2. Jeanne Liedtka and Tim Ogilvie, Designing for Growth: A Design Thinking Tool Kit for Managers, Columbia Business School Publishing, E-ISBN 978-0-231-52796-5
3. B. K. Chakravarthy, Janaki Krishnamoorthi, Innovation By Design: Lessons from Post Box Design & Development, Springer India, 2013

4. Donald A. Norman, "The Design of Everyday Things", MIT Press, 2013 (ISBN: 978-0262525671)

REFERENCES:

1. Tim Brown, "Change by Design", Harper Business, 2012 (ISBN: 978-0062337382)
2. Daniel Ling, "Complete Design Thinking Guide for Successful Professionals", Create Space Independent Publishing, 2015 (ISBN: 978-1514202739)
3. Bruno Munari, "Design As Art", Penguin UK, 2009 (ISBN: 978-0141035819)
4. Tom Kelly, Jonathan Littman, "The Art of Innovation", HarperCollins Business, 2002 (ISBN: 978-0007102938)
5. Thomas Lockwood, "Design Thinking: Integrating Innovation, Customer Experience, and Brand Value", Allworth Press, 2009 (ISBN: 978-1581156683)
6. Joost Groot Kromelink, "Responsible Innovation: Ethics, Safety and Technology", 2nd ed., TU Delft, Faculty of Technology, Policy and Management, 2019 (e-Book ISBN: 978-9463662024)
7. Jimmy Jain, "Design Thinking for Start-up's: A Handbook for Readers and Workbook for Practitioners", Notion Press, 2018 (ISBN: 978-1642495034)
8. Beverly Rudkin Ingle, "Design Thinking for Entrepreneurs and Small Businesses: Putting the Power of Design to Work", A Press, 2013 (ISBN: 978-1430261810)

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II B.Tech. II-Sem (CSE)

P C
3 1.5

(A0597194) JAVA PROGRAMMING LAB**COURSE OBJECTIVES:**

- ❖ To make the student operating systems.
- ❖ Learn object oriented way of solving problems.
- ❖ To teach the student to write programs in Java to solve the problems

COURSE OUTCOMES:

After Completion of the Lab Course student should be able:

- ❖ Student can able to write a programs using classes and objects.
- ❖ Student can able to develop the polymorphic behaviour of objects.
- ❖ Students can able to design a software using object oriented approach.
- ❖ Able to implement the programs handling built in exceptions and creating custom Exceptions.
- ❖ Able to develop the Mutli thread programming.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	3	1	2				1		2	2			
CO2	2	1	3	2	2							3			
CO3	1	2	2	1	1							2			
CO4	1	2	1	1					2		2	2			
CO5	2	2	2		2						1	2			

LIST OF PROGRAMMES

- 1) Write a Java Program to find the reverse of a given number. And also check whether it is palindrome or not.
- 2) Write a Java Program to print Fibonacci sequence (rule: The first two values in the sequence are 0 and 1. Every subsequent value is the sum of the two values preceding it.)
- 3) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
- 4) Write a Java program to multiply two given matrices.
- 5) Write a Java program to find both the largest and smallest number in a list of integers.
- 6) Write a Java program to find the volume of a box by creating objects.
- 7) Write a Java program to implement all arithmetic operations with class methods for each operation. User must provide values from Keyboard.
- 8) Write a Java program to implement parameter passing techniques:
- 9) a) call-by-value b) call-by-reference
- 10) Write a Java program to implement the following:
- 11) a) Overloading methods b) overloading constructors c) recursion
- 12) Write a Java program to implement multi-level inheritance and also demonstrate super keyword.
- 13) Write a Java program to demonstrate method overriding by implementing dynamic method dispatch?
- 14) Write a Java program to create and abstract class called Shape which inherits Rectangle and triangle to calculate area of each shape by implementing abstract method of Shape class by implementing hierarchical inheritance.
- 15) Write a Java program to implement multiple-inheritance?
- 16) Write a Java program to import user defined packages to display results for any mathematical operations like addition, subtractions, multiplications and division (class methods) from one package and also producing results square, cube and square-root of a given number (instant methods) from another package.

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- 17) Write a Java program to sort a list of names in ascending order.
- 18) Write a Java program that checks whether a given string is a palindrome or not.
- 19) Ex: MADAM is a palindrome
- 20) Write a Java program to handle multiple exceptions and also use finally?
- 21) Write a Java program to handle user-defined exceptions?
- 22) Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
- 23) Write a Java program that displays the count of number of characters, lines and words in a text file.(user provide file using cmd line args)
- 24) Write a Java program that creates three threads. First thread displays “Good Morning” every one second, the second thread displays “Hello” every two seconds and the third thread displays Welcome” every three seconds.
- 25) Write a Java program that correctly implements producer consumer problem using the concept of inter-thread communication
- 26) Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle. (Use java.net)
- 27) Write a Java program to retrieve the information from the given URL? (**Note:** Read the URL from Command Line Arguments).
- 28) Write a java program to create a sample TCP chat application where client and server can chat with each other?

REFERENCES:

- 1) Java; the complete reference, 11th editon, 2018 Herbert schildt, TMH.
- 2) An Introduction to programming and OO design using Java, 2015, J.Nino and F.A. Hosch, John wiley & sons Programming in Java, Sachin Malhotra, Saurabh Choudhary, Second Edition.
- 3) An Introduction to OOP, second edition, T. Budd, Pearson education.
- 4) Introduction to Java programming 6th edition, Y. Daniel Liang, Pearson education.

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` II B.Tech. II-Sem (CSE)

P C
3 1.5

(A0598194) DESIGN AND ANALYSIS OF ALGORITHMS LAB

COURSE OBJECTIVES:

- ❖ The principle objective of this course is to build solid foundation in algorithms and their applications.
- ❖ To implement various divide and conquer techniques examples.
- ❖ To implement various Greedy techniques examples.
- ❖ To implement various Dynamic Programming techniques examples.
- ❖ To provide a practical exposure of all algorithms.
- ❖ To understand the importance of algorithm and its complexities.

COURSE OUTCOMES:

- ❖ Students will be able to calculate the time complexity of algorithm.
- ❖ Students will be able to sort the given numbers using various sorting algorithms.
- ❖ Students will be able to write programs for the problems using Divide and Conquer.
- ❖ Students will be able to write programs for the problems using Greedy Method.
- ❖ Students will be able to write programs for the problems using Dynamic programming.
- ❖ Students will be able to write programs for the problems using Backtracking.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2			2				2	3					
CO2	2	2			2				2	2		1			
CO3	3	2		1	3				2	1					
CO4	2	3			2	1			2	1		1			
CO5	3	2			2				2	2					
CO6	2	2	1		2				2	2					

EXPERIMENTS

1. Write a program to perform operation count for a given pseudo code
2. Write a program to perform Bubble sort for any given list of numbers.
3. Write a program to perform Insertion sort for any given list of numbers.
4. Write a program to perform Quick Sort for the given list of integer values.
5. Write a program to find Maximum and Minimum of the given set of integer values.
6. Write a Program to perform Merge Sort on the given two lists of integer values.
7. Write a Program to perform Binary Search for a given set of integer values recursively and non- recursively.
8. Write a program to find solution for knapsack problem using greedy method.
9. Write a program to find minimum cost spanning tree using Prim's Algorithm.
10. Write a program to find minimum cost spanning tree using Kruskal's Algorithm.
11. Write a program to perform Single source shortest path problem for a given graph.
12. Write a program to find solution for job sequencing with deadlines problem.
13. Write a program for all pairs shortest path problem.
14. Write a program to solve N-QUEENS problem.
15. Write a program to solve Sum of subsets problem for a given set of distinct numbers.

REFERENCES:

1. Data Structures and Algorithms by G.A.V. Pai, 2017, TMH.
2. Fundamentals of Computer Algorithms by Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, 2nd edition, University Press.

II B.Tech. II-Sem (CSE)

P C
3 1.5**(A0599194) DATABASE MANAGEMENT SYSTEMS LAB****COURSE OBJECTIVES:**

Student will be able to:

- ❖ Create and delete database schemas and execute SQL queries
- ❖ Inserting data, Altering and dropping the tables.
- ❖ Various types of data conversions using the functions.
- ❖ Make Use of PL/SQL variables and Language Components.
- ❖ Make Use of Identifiers in PL/SQL.
- ❖ Make Use of Anchored Data type.

COURSE OUTCOMES:

Upon completion of the lab, the student should be able to:

- ❖ Map the model into a relational database system.
- ❖ Implement the given schema on a relational DBMS.
- ❖ Design, develop, and maintain Oracle Database Objects.
- ❖ Use a database language for manipulating and querying data.
- ❖ Develop advanced packages, stored procedures, and triggers.
- ❖ Develop various functions definitions and procedures using PL/SQL.

MAPPING WITH COs & POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1			3		2								1		
CO2								2		2				2	
CO3			2							1	1			1	1
CO4					1							2	1		2
CO5	1		2										2		1

RECOMMENDED SYSTEMS/SOFTWARE REQUIREMENTS:

- ❖ Intel based desktop PC
- ❖ Mysql /Oracle latest version Recommended.

LIST OF EXPERIMENTS/PROGRAMMES

- 1) Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
- 2) Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.
Example:- Select the roll number and name of the student who secured fourth rank in the class.
- 3) Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
- 4) Nested Queries and correlated nested queries
- 5) Table alterations
- 6) Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
- 7) Creating procedures
- 8) Creating functions and packages
- 9) Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers.
- 10) Introduction to ORACLE reports

REFERENCES:

1. ORACLE PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Edition.
2. ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc-Graw Hill.
3. SQL & PL/SQL for Oracle 10g, Black Book, Dr.P.S. Deshpande.

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III B.Tech. I-Sem (CSE)

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(A0513195) COMPUTER NETWORKS AND SECURITY**COURSE OBJECTIVES:**

- ❖ An understanding of the overriding principles of computer networking, including protocol design, protocol layering, algorithm design, and performance evaluation.
- ❖ An understanding of computer networking theory, including principles embodied in the protocols designed for the application layer, transport layer, network layer, and link layer of a networking stack.
- ❖ An understanding of specific implemented protocols covering the application layer, transport layer, network layer, and link layer of the Internet (TCP/IP) stack
- ❖ An understanding of security issues

COURSE OUTCOMES:

- ❖ Students are able to classify network services, physical and data link layer
- ❖ Students are able to familiar with network layer, routing algorithms.
- ❖ Students will be able to understand TCP, UDP and DNS.
- ❖ Students will be able identify the major types of threats to information security and the different cipher techniques.
- ❖ Students will be able to understand the different conventional encryption techniques and MAC.
- ❖ Students will be able to familiarize the Public key cryptography and key management

MAPPING WITH COs &POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	P11	P12	PS01	PS02	PS03
CO1	3	2	2	1	1	1		1	1			2	3	1	2
CO2	3	3	3	2	2	1	2					2	3	2	1
CO3	3	3	3	1	1		1					2	3	2	3
CO4	2	3	1	2	2	3	2	1				2	1	2	2
CO5	3	2	1	2	1	3	2		1			2	1	1	2
CO6	3	3	1	3	1	3	2		1			2	2	1	2

UNIT-1:

Introduction: Network Hardware, Network Software, References Models. **The Physical Layer:** Guided Transmission Media, Communication Satellites. **Data Link Layer:** Data link Layer Design Issues, Error detection and correction, Elementary Data Link Protocols, and Sliding Window Protocols.

UNIT-2:

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

UNIT-3:

The Transport Layer: The Transport Service, Elements of Transport Protocols, The Internet Transport Protocols: UDP, The Internet Transport Protocols: TCP. **Application Layer:** DNS-The Domain Name System, Electronic Mail.

UNIT-4:

Security goals, Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms.

UNIT-5:

Conventional Encryption Principles, Techniques Conventional encryption algorithms, cipher block modes of operation, Approaches of Message Authentication, hash functions, Secure Hash Functions and HMAC.

UNIT-6:

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Public key cryptography principles, public key cryptography algorithms (RSA, DIFFIE-HELLMAN, DSS), digital signatures, Certificate Authority and key management, X.509 Directory Authentication Service.

TEXT BOOKS:

- 1) Computer Networks, Andrew S. Tanenbaum, Fourth Edition, Pearson Education.
- 2) TCP/IP Protocol suite Fourth Edition- Behrouz A. Forouzan
- 3) Cryptography and network Security, Third edition, Stallings, PHI/Pearson
- 4) Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.

REFERENCES:

- 1) Computer Communications and Networking Technologies, Michael A. Gallo, William M. Hancock, Cengage Learning.
- 2) Computer Networks, Bhushan Trivedi, Oxford.
- 3) Computer Networks: Principles, Technologies and Protocols for Network Design, Natalia Olifer, Victor Olifer, Wiley India.
- 4) Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition, Tata McGraw Hill.
- 5) Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W. Manzuik and Ryan Permech, Wiley Dreamtech
- 6) Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
- 7) Principles of Information Security, Whitman, Thomson

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III B.Tech. I-Sem (CSE)

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(A0514195) OPERATING SYSTEMS**COURSE OBJECTIVES:**

- ❖ This course deals with functions, structures and history of operating systems.
- ❖ To understand the design issues associated with operating systems.
- ❖ To understand various process management concepts including scheduling, synchronization, deadlocks.
- ❖ To be familiar with multithreading and the concepts of memory management including virtual memory.
- ❖ To understand the issues related to file system interface and implementation, disk management with protection and security mechanisms.
- ❖ Some example operating systems (Unix, Windows, Solaris etc)

COURSE OUTCOMES:

- ❖ Students will learn about and understand services provided by and the design of an operating system
- ❖ Students will learn about system calls for managing processes, memory and the file system and various process management concepts including scheduling
- ❖ Students will learn about and understand synchronization, deadlocks
- ❖ Students will learn about and understand different approaches to memory management
- ❖ Students will learn about and understand the issues related to file system interface and implementation, disk management
- ❖ Students will learn about and understand secondary storage structure and tertiary storage devices.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2				1		1		1	1		1	2	2	1
CO2	1	2	2	1					2	1			2	1	1
CO3	1	3	2	2	1				1	1			1	1	1
CO4	1	3	2		1				1	1			2	1	1
CO5	1	2	1	2	1				1				1	2	2
CO6	1	2	1	1			1				1	1	3	2	1

UNIT I

Introduction - what operating systems do, computer system architecture, process management, memory management, protection and security, distributed systems, special purpose systems

System structure - operating system services, systems calls, types of system calls, system programs, operating system structure, operating systems generation, system boot.

UNIT II

Process concepts - overview, process scheduling, operations on process, inter-process communication.

Multithread Programming – overview, multithreading models

Process scheduling – basic concepts, scheduling criteria, process scheduling algorithms, algorithm evaluation.

UNIT III

Concurrency - Process synchronization, the critical-section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors

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

UNIT IV

Memory Management Strategies – back ground, Swapping, contiguous memory allocation, paging, segmentation

Virtual memory management – background, demand paging, copy-on-write, page-replacement algorithms-FIFO, LRU, Optimal, LFU, MFU, Second chance algorithm

UNIT V

File system – file concept, Access Methods, Directory structure, protection.

File System implementation - File system structure, file system implementation, directory implementation, allocation methods, free-space management, Recovery.

UNIT VI

Secondary-storage structure- overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management, RAID structure

Tertiary storage devices- removable disks, tapes, future technology, performance issues.

TEXT BOOKS:

- 1) Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley.

REFERENCES:

- 1) Operating Systems: Internals and Design Principles, Stallings, Sixth Edition–2009, Pearson Education.
- 2) Principles of Operating Systems, Naresh Chauhan, Oxford

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III B.Tech. I-Sem (CSE)

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(A0515195) COMPILER DESIGN**COURSE OBJECTIVES:**

- ❖ Thorough understanding of the overall architecture of a modern compiler.
- ❖ Being familiar with both top-down and bottom-up parsing paradigms.
- ❖ Fluent with syntax-directed translation scheme and different compiler-compilers.
- ❖ Knowledgeable with assembly language and code-block based code generation scheme.
- ❖ Knowing the inner details of compilers, libraries, operating systems/platforms, and how they interact with each other to form modern computing environments.

COURSE OUTCOMES:

- ❖ Identify and understand different phases and passes of Compiler and their functioning.
- ❖ Understand lexical, syntax and semantic analysis processes.
- ❖ Understand and define the role of lexical analyzer, use of regular expression and transition diagrams.
- ❖ Understand Finite state machine and use Context free grammar, and parse tree construction
- ❖ Determine code generation and optimization techniques.
- ❖ Apply error detection and correction methods.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	3											2	1	
CO2	2	1													
CO3					1	2								1	
CO4	3						2				1	2	1	1	
CO5					1		1	1					2		
CO6											2				1

UNIT-I

Introduction to compilers: compilers, cousins of the compiler, phases of a compiler, interpreter, grouping of phases into pass, bootstrapping

Lexical analysis: role of the lexical analyzer, input buffering, a language for specifying lexical analyzers

UNIT-II

Syntax analysis: the role of the parser, context free grammars, writing a grammar: eliminating ambiguity, elimination of left recursion, elimination of left factoring

Top-down parsing: Recursive descent parsing, first and follow, predictive parsing, construction of predictive parsing table.

UNIT-III

Bottom up Parsing: handles, handle pruning, shift reduce parsing, viable prefixes, conflicts during shift reduce parsing

LR Parsers: SLR Parsing: LR (0) items, SLR Parse table. CLR Parser: CLR (1) Items, CLR (1) Parsing table. LALR (1) parser: LR (1) items, LALR (1) parsing table.

UNIT-IV

Semantic analysis: type checking: type checking of expressions, type checking of statements, type checking of functions, type conversions

Syntax directed translation: form of a syntax directed definition, synthesize attributes, inherited attributes, dependency graph, annotated parse tree.

Intermediate code generation: intermediate code forms: abstract syntax tree, polish notation, three address code .implementation of three address code statements: quadruples, triples, indirect triples

UNIT-V

Symbol table and Runtime environments: symbol table format, storage organization, storage allocation strategies, parameter passing, activation trees, activation records, storage allocation for arrays, strings and records

UNIT-VI

Code optimization: Consideration for Optimization, Scope of Optimization, principle sources of optimization: function preserving transformations, local Optimization, loop Optimization, global Optimization

Data flow analysis: construction of flow graph, loops in flow graph

Code generation: object code forms, issues in code generation, a simple code generator algorithm, generic code from DAGS

TEXT BOOKS:

1. Compilers principles, techniques, &tools- A.V.Aho. J.D.Ullman; pearson Education. Second edition.

REFERENCES:

1. Compiler design: Theory, Tools and examples by Seth D. Bergmann.
2. Compiler design, K. Muneeswaran, Oxford.

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III B.Tech. I-Sem (CSE)

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(A0516195) SOFTWARE ENGINEERING**COURSE OBJECTIVES:**

- ❖ To understand Software development as a process.
- ❖ Various software process models and system models.
- ❖ Various software designs: Architectural, object oriented, user interface etc.
- ❖ Software testing methodologies overview: various testing techniques including white box testing black box testing regression testing etc.
- ❖ Software quality: metrics, risk management quality assurance etc.

COURSE OUTCOMES:

- ❖ Understand software development life cycle
- ❖ Analyze and Apply various process models for a project
- ❖ Prepare SRS document for a project
- ❖ Understand requirement and Design engineering process for a project
- ❖ Identify different principles to create an user interface
- ❖ Identify different testing methods and metrics in a software engineering project

MAPPING WITH COs&POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1							1	1			1	2	
CO2	2	3	1						2	2				3	
CO3	2	2								2				1	
CO4	2	1	2						1	1				3	
CO5	2	2	1						1	1				2	
CO6	2							1						2	

UNIT I

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths. **A Generic view of process:** Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

UNIT II

Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process. **Software Requirements:** Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

UNIT III

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. **System models:** Context Models, Behavioral models, Data models, Object models.

UNIT IV

Design Engineering: Design process and Design quality, Design concepts, the design model. **Creating an architectural design:** Software architecture, Data design, Architectural styles and patterns.

UNIT V

Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation. **Testing Strategies:** A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

UNIT VI

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

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

TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition. McGrawHill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education.

REFERENCES:

1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers
2. Software Engineering principles and practices, Deepak Jain, Oxford.
3. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.
4. Systems Analysis and Design- Shely Cashman Rosenblatt, Thomson Publications.
5. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.

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III B.Tech. I-Sem (CSE)

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(A0517195) WEB PROGRAMMING

(For Branches: EEE & CSE)

COURSE OBJECTIVES:

- ❖ In-depth learning of client side scripting like HTML, JavaScript and server side scripting like servlets, JSPs. Also focuses on XML and web servers and database interfacing.
- ❖ Use the “echo” and “print” to send output to the browser.
- ❖ Learn how to create and use PHP basic and advanced concepts.
- ❖ Write PHP programs that access form data

COURSE OUTCOMES:

- ❖ Student can able to demonstrate the HTML important tags and for designing static web pages and separate design from content using CSS.
- ❖ Able to design a webpage with more user interactivity using JavaScript and understand the need of XML in the developing of Web applications.
- ❖ Students able to understand the need of Server side scripting using Servlets and JSP along with database connectivity.
- ❖ Understand the syntax and basic concepts of PHP, conditional and looping statements, Arrays and Functions, strings and files
- ❖ Understand and develop programs on PHP object-oriented concepts and advanced concepts (cookies&sessions) and data and time functions.
- ❖ Be able to develop a form containing several fields and be able to process the data with database using html & PHP-based script.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1		1		1	1	1		1	2	1	1	1		1
CO2	1		2										1		
CO3	1		3	2	2			2	2	2	3	1	2	2	2
CO4	2	1	2		1					1			1		
CO5	1		2		2					1	1			1	1
CO6	1	1	3	2	1	2	2		3	2	3	1	1	2	2

UNIT I

Introduction to HTML - HTML common tags, HTML program structure, Attributes, List, Tables, images, forms, Frames, Cascading Style sheets

UNIT II

JavaScript - Introduction to Java Scripts, Data Validation using Java Script.

XML - Document type definition, XML Schemas, Document Object model, Presenting XML.

UNIT III

Web Servers and Servlets: Introduction to Servlets, Lifecycle of a Servlet, A Simple servlet, The Servlet API, Reading Servlet Parameters, Handling Http Request & Responses.

JSP Application Development - Using Scripting Elements, Implicit JSP Objects, Sharing Session and Application Data.

Database Access- Database Programming using JDBC, Types of JDBC Drivers, Accessing a Database from a servlets and JSP.

UNIT IV

Introduction to PHP: Features of php, Basic Syntax, Php variables, Php Data types, Type casting, Operators and Expressions, control statements and Lopping statements, introduction to arrays, array functions, stings-Its related library functions, functions- parameter passing techniques, Recursive functions.

UNIT V

Object oriented programming concepts, PHP Advanced Concepts- Cookies, Sessions.

Working with Date and Time-Displaying Human-Readable Dates and Times, Finding the Date for a Weekday, Getting the Day and Week of the Year, Determining Whether a Given Year Is a Leap Year, Obtaining the Difference Between Two Dates, Determining the Number of Days in the Current Month, Determining the Number of Days in Any Given Month.

UNIT VI

Creating and Using Forms- Understanding Common Form Issues, Validating form input, Working with multiple forms, and Preventing Multiple Submissions of a form.

PHP and Database Access- Connecting to a MYSQL database, performing basic database operations.

TEXT BOOKS:

1. HTML Black Book – Steve Holzner.
2. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH
3. Java Server Pages –Hans Bergsten, SPD O'Reilly
4. Beginning PHP and MySQL, 3rdEdition, Jason Gilmore, Apress Publications (Dream tech.).
5. PHP 5 Recipes A problem Solution Approach Lee Babin, Nathan A Good, Frank M.Kromann and Jon Stephens.

REFERENCES:

1. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, CengageLearning Publications.
2. PHP 5.1, I. Bayross and S.Shah, The X Team, SPD.
3. Programming world wide web-Sebesta, Pearson.
4. Web Technologies, Uttam K. Roy, Oxford.
5. Core Servlets and Javaserer Pages Volume 1: Core Technologies by Marty Hall and Larry Brown Pearson.
6. An Introduction to web Design and Programming –Wang-Thomson.

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III B.Tech. I-Sem (CSE)

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(A0015194) ENVIRONMENTAL SCIENCE

(Mandatory Learning-II)

(For Branches CE, EEE, Mech., ECE & CSE)

COURSE OBJECTIVES:

- ❖ Creating the awareness about environmental problems among people.
- ❖ Imparting basic knowledge about the environment and its allied problems.
- ❖ Developing an attitude of concern for the environment.
- ❖ Motivating public to participate in environment protection and environment improvement.
- ❖ Acquiring skills to help the concerned individuals in identifying and solving environmental problems.
- ❖ Environmental education should be compulsory, right from the primary up to the post graduate stage.
- ❖ Environmental education should have an interdisciplinary approach by including

COURSE OUTCOMES:

- ❖ Understand environmental problems arising due to developmental activities.
- ❖ Realize the importance of ecosystem and biodiversity for maintaining ecological balance.
- ❖ Identify the natural resources and suitable methods for conservation and sustainable development.
- ❖ Identify the environmental pollutants and abatement devices.
- ❖ Adopt practices that help in promoting balance in nature by making judicious utilization of recourses.

MAPPING WITH COs&POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	2					1	3	2				2			
CO2	1	2					3	1	2			2			
CO3	1				1	1	3	1	1		1	2			
CO4		1	1		2	1	1	1			1	2			1
CO5		1	1				2	1				2			1

UNIT I

MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL SCIENCE: Environment - Definition, scope and importance, Segments of Environment-Importance, Productivity, Aesthetical& Optional values of nature, need for public awareness.

UNIT II

RESOURCES AND UTILIZATION: Renewable and non-renewable resources.

- a) Natural Resources: soil & water sources (salinity intrusion – conflicts of over utilization of water Resources-water logging, Hydro power project-problems), forest & mineral resources – Utilization-problems.
- b) Non conventional resources of energy(Solar Energy, wind energy and their applications)
- c) Chemical fertilizers and pesticides-problems.
- d) Green Revolution-white revolution- blue Revolution.
- e) Non equitable distribution of Resources.

UNIT III**a) CONCEPTS OF ECO-SYSTEM**

Structure and functions of an ecosystem: producers, consumers and decomposers- Interaction between biotic and abiotic factors in an ecosystem- Energy flow and its

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importance- Trophic levels- food chain- Food web –Ecological Pyramid, Ecological succession

b) TYPES OF ECOSYSTEM

Understanding the types of ecosystem:

- (i) Terrestrial (forest, grassland and desert) and
- (ii) Aquatic (fresh water and salt water) with an example of each.

UNIT IV

BIODIVERSITY: Introduction – Definition - genetic, species and ecosystem diversity- - Biogeographical classification of India- Value of biodiversity- Hot-spots of biodiversity- Biodiversity at global, National and local levels- India as a mega diversity nation - Hot-spots of biodiversity- Threats to biodiversity- IUCN Red data book.

Conservation of bio diversity (IN-SITU and EX-SITU conservation)

UNIT V

ENVIRONMENTAL POLLUTION: Introduction - Cause, effects and control measures of

- a) Air pollution
- b) Water pollution
- c) Soil pollution
- d) Marine pollution
- e) Noise pollution
- f) Thermal pollution
- g) Nuclear hazards

Municipal Solid waste Management: Sources and Disposable methods.

Diaster management: floods, earthquake, cyclone.

UNIT VI

HUMAN POPULATION:

- a) Population and Environment:- Definition of species, community, population; Population growth rate curves, Sex ratio, From unsustainable to sustainable development, Diseases-HIV, Malaria, Diaharia, Cancer.
- b) Human rights, fundamental duties and value education.
- c) Women and child welfare & Family welfare programs.

SOCIAL ISSUES:

- a) Resettlement and rehabilitation of people.
- b) Energy Crisis – urban and rural sectors.
- c) Greenhouse effect and global warming.
- d) Climatic changes.
- e) Acid rain.
- f) Ozone layer depletion.
- g) Sustainability- water conservation methods- Rain water harvesting.

TEXT BOOKS:

1. Deswal, S and Deswal A., (2004), A Basic Course in Environmental Studies, Dhanpat Rai & Co. Delhi.
2. Anubha Kousik and C P Kousik, New age international publishers.
3. Garg, S.K and Garg, R., (2006), Ecological and Environmental Studies, Khanna Publishers, Delhi.
4. Chauhan, A.S., (2006), EnvironmentalStudies, Jain Brothers, New Delhi

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III B.Tech. I-Sem (CSE)

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(A0019195) PROFESSIONAL ETHICS AND SOFT SKILLS
(Skill Development Course-III)

COURSE OBJECTIVE:

- ❖ The main objective of Engineering Ethics is to increase the awareness in engineering failures. Engineering decisions can impact public health, safety, business practices and politics. Engineering ethics is the field of applied ethics and system of moral principles that apply to the practice of engineering. The field examines and sets the obligations by engineers to society, to their clients, and to the profession. Engineering ethics in academic institutions has been undertaken by the directives of Supreme Court for creating awareness interactively among engineering students of all disciplines. By studying engineering ethics, the students develop awareness and assessment skill of the likely impact of their future decisions on moral and ethical grounds.

COURSE OUTCOMES:

- ❖ To apply ethical theories and moral reasoning to a good professional
- ❖ Understand the professional behaviour and implementation of process of communication
- ❖ To approach of corporate communication problem solving techniques
- ❖ To have a practical orientation of interpersonal communication
- ❖ Aware of intellectual property rights

MAPPING WITH COs&POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2					2	2	3	3	3	1	2			
CO2	1		1			2	1	3	3	3	1	2	2		
CO3	1		2			2	1	2	3	2	1	2	2		
CO4	2					2	1	3	2	2	1	3	2		
CO5	3					2	1	3	2	3	1	3			

UNIT-I

Nature and Scope of Engineering Ethics: Definition, Nature, Scope – Moral Dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory- Moral Reasoning and Ethical theories – Theories of Right Action-Self – Utilitarianism interest- Use of ethical Theories- case study.

UNIT-II

Professional Etiquettes: Professional Etiquettes – Mobile Etiquettes – Email Etiquettes - Kinesics – Proxemics
- Chronemics – Chromatics – Olfacts - Haptics – Case study..

UNIT-III

Corporate Communication: Communication Models- Types of Communication – Downward and Upward Communication- Business Deliberations – Meetings – Negotiation Skills - Case Study.

UNIT-IV

Soft Skills: Interpersonal Communication – Johari Window – Interpersonal conflict resolutions- Daniel Goleman's Emotional Intelligence.

UNIT-V

Global Issues: Multinational Corporations – Corporate Governance - Corporate Social Responsibility Environmental Ethics – case study.

UNIT-VI

Introduction to Intellectual Property: Meaning and Types of Intellectual Property – Recent developments of the copy right act –Trademark Protection – Patent Law - Plagiarism.

TEXT BOOKS:

1. Professional Ethics by R.Subramanian, OXFORD
2. Business Communication , P.D. Chaturvedi, Mukesh Chaturvedi

REFERENCES:

1. The ACE of Soft Skills (Attitude, Communication and Etiquette for success) by – GopalaswamyRamesh & Mahadevan Ramesh, Pearson 2010.
2. Essentials of Business Communication, Rajendra Pal, JS.Korlahhi, S.Chand
3. Intellectual Property Right , Deborah E. BouchouxS, Cengage, 2005
4. Business Ethics and Professional Values, A.B. Rao, Excel,2009
5. M.P. Raghavan [2006], Professional Ethics and Human Values, Scitech Publications, Chennai.

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(A0582195) COMPUTER NETWORKS LAB**COURSE OBJECTIVE:**

- ❖ This course deals about the implementation of computer networks as well as Information Security. In the Computer Networks portion of the syllabus emphasis is given on various protocols and algorithms. In the Information Security section several different kinds of security measure to prevent attacks have to be implemented to make sure that the data does not fall into unauthorized users.

COURSE OUTCOMES:

- ❖ Students are able to classify network services, physical and data link layer
- ❖ Students are able to familiar with network layer, routing algorithms.
- ❖ Students will be able to understand TCP, UDP and DNS.
- ❖ Students will be able identify the major types of threats to information security and the different cipher techniques.
- ❖ Students will be able to understand the different conventional encryption techniques and MAC.
- ❖ Students will be able to familiarize the Public key cryptography and key management

MAPPING WITH COs&POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	P11	P12	PS01	PS02	PS03
CO1	3	2	2	1	1	1		1	1			2	3	1	2
CO2	3	3	3	2	2	1	2					2	3	2	1
CO3	3	3	3	1	1		1					2	3	2	3
CO4	2	3	1	2	2	3	2	1				2	1	2	2
CO5	3	2	1	2	1	3	2		1			2	1	1	2
CO6	3	3	1	3	1	3	2		1			2	2	1	2

COMPUTER NETWORKS

1. Write a program to implement Sliding Window Protocol.
2. Write a program to implement any Error detection code.
3. Write a program to implement Distance Vector Routing.
4. Write a program to implement Shortest Path Algorithm.
5. Write a program to implement TCP echo using client–server program
6. Write a program to implement File transfer using UDP.

INFORMATION SECURITY

1. Write a program to implement Caesar cipher.
2. Write a program to implement Playfair cipher.
3. Write a program to implement Hill cipher.
4. Write a program to implement any symmetric key algorithm.
5. Write a program to Implement RSA Cryptosystem
6. Write a program to Implement the Diffie–Hellman key exchange protocol

TEXT BOOKS:

- 1) Computer Networks, Andrew S. Tanenbaum, Fouth Edition, Pearson Education.
- 2) Cryptography and network Security, Third edition, Stallings, PHI/Pearson

REFERENCES:

- 1) Computer Networks: Principles, Technologies and Protocols for Network Design, Natalia Olifer, Victor Olifer, Wiley India.
- 2) Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition, Tata McGraw Hill.
- 3) Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
- 4) Principles of Information Security, Whitman, Thomson

III B.Tech, I-Sem (CSE)

P C

(A0583195) OPERATING SYSTEMS LAB

COURSE OBJECTIVES:

A student will be able to:

- ❖ Prepare students for easy transfer from academia into practical life.
- ❖ Get an Insight into the Computer Technologies.
- ❖ Obtain Basic Knowledge of Operating Systems.

COURSE OUTCOMES:

The main learning outcomes are:

- ❖ Implement various modules for CPU scheduling algorithms
- ❖ Simulation of Bankers algorithm for deadlock avoidance and prevention
- ❖ Implement various modules for PAGE replacement algorithms
- ❖ Simulate various memory allocation techniques
- ❖ Simulate various file allocation and paging techniques

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	3													
CO2		3	1												
CO3	1	2													
CO4	1	3	1												
CO5	1	2													

1. Simulate the following CPU scheduling algorithms
 - a) FCFS b) SJF c) Priority d) Round Robin
2. Simulate Bankers Algorithm for Dead Lock Avoidance
3. Simulate Bankers Algorithm for Dead Lock Detection
4. Simulate the page replacement algorithms
 - a) FIFO b) LRU c) Optimal
5. Simulate the dynamic storage allocation strategies
 - a) First fit b) Best fit c) Worst fit
6. Simulate MVT architecture
7. Simulate MFT architecture
8. Simulate sequential file allocation strategy
9. Simulate linked file allocation strategy
10. Simulate paging technique
11. Simulate following File Organization Techniques
 - a) Single level directory b) Two level directory

REFERENCES:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley.
2. Operating Systems, A Concept based Approach - D.M.Dhamdhare, Second Edition, TMH.
3. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition–2009, Pearson Education.

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III B.Tech, I-Sem (CSE)

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(A0584195) WEB PROGRAMMING LAB**COURSE OBJECTIVE:**

- ❖ In-depth learning of client side scripting like HTML, JavaScript and server side scripting like servlets, JSPs. Also focuses on XML and web servers and database interfacing.
- ❖ Use the “echo” and “print” to send output to the browser.
- ❖ Learn how to create and use PHP basic and advanced concepts.
- ❖ Write PHP programs that access form data

COURSE OUTCOMES:

- ❖ Student can able to demonstrate the HTML important tags and for designing static web pages and separate design from content using CSS.
- ❖ Able to design a webpage with more user interactivity using JavaScript and understand the need of XML in the developing of Web applications.
- ❖ Students able to understand the need of Server side scripting using Servlets and JSP along with database connectivity.
- ❖ Understand the syntax and basic concepts of PHP, conditional and looping statements, Arrays and Functions, strings and files
- ❖ Understand and develop programs on PHP object-oriented concepts and advanced concepts (cookies&sessions) and data and time functions.
- ❖ Be able to develop a form containing several fields and be able to process the data with database using html & PHP-based script.

MAPPING WITH COs&POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1		1		1	1	1		1	2	1	1	1		1
CO2	1		2										1		
CO3	1		3	2	2			2	2	2	3	1	2	2	2
CO4	2	1	2		1					1			1		
CO5	1		2		2					1	1			1	1
CO6	1	1	3	2	1	2	2		3	2	3	1	1	2	2

Week 1

1. Write a HTML program to develop static Home Page using frames.
2. Write a HTML program to develop a static Registration Form.
3. Write a HTML program to develop a static Login Page.
4. Write HTML for demonstration of cascading style sheets.

Week 2

5. Write a javascript program to validate USER LOGIN page.
6. Write a javascript program for validating REGISTRATION FORM

Week 3

7. Write an XML for person information and access the data using XSL.
8. Write an XML for student information and access second student's data using DOM.

Week 4

9. Write a servlet for displaying a message.
10. Write a servlet that reads parameters from employee login page.

Week 5

11. Write a JSP that reads parameters from user login page.
12. Write a JSP that reads a value, creates a cookie and retrieves it.
13. Write a servlet that connects to the database and retrieves the data and displays it.

Week 6

14. Write a PHP program to perform arithmetic operations on variables.
15. Write a PHP programs on different controls and looping statements.

Week 7

16. Create a PHP program to demonstrate the different predefined functions in strings.

Week 8

17. Create a PHP program on Inheritance concept.

18. Create a PHP program on constructors and destructors.

19. Create a PHP program on interfaces.

Week 9

20. Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Use PHP script for programs 1 and 2.

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

b) Read the User id and Passwords entered in the Login form and authenticate with the values (UserId and Passwords) available in the cookies. If he is a valid user (i.e., UserName and Password match) you should welcome him by name (UserName) else you should display "You are not an authenticated user".

Week 10

21. Write a PHP program to start a PHP Session.

22. Write a PHP program to destroy a PHP Session.

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

Week 11

24. Write a PHP program on date and time concepts.

Week 12

25. Write a PHP program on multiple forms using hidden fields.

26. Write a PHP program to prevent multiple submissions on client and server side.

Week 13

27. Write a PHP program to perform the following database operations :

i. Create ii. Insert iii. Update iv. Delete

28. Write a PHP which does the following job: Authenticate the user when he submits the login form using the Username and Password.

REFERENCES:

1) HTML Black Book – Steve Holzner.

2) The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH

3) Java Server Pages –Hans Bergsten, SPD O'Reilly

4) Beginning PHP and MySQL, 3rd Edition, Jason Gilmore, Apress Publications (Dream tech.).

5) PHP 5 Recipes A problem Solution Approach Lee Babin, Nathan A Good, Frank M.Kromann and Jon Stephens.

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III B.Tech. II-Sem (CSE)

L T C
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(A0521196) C# & .NET FRAMEWORK**AIM:**

- ❖ To cover the fundamental concepts of the C# language and the .NET framework.

COURSE OBJECTIVES:

- ❖ The student will gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the Framework.
- ❖ The student will gain programming skills in C# both in basic and advanced levels.
- ❖ By building sample applications, the student will get experience and be ready for large-scale projects.

COURSE OUTCOMES:

- ❖ Understand the .NET Framework and syntax of basic C# programming constructs.
- ❖ Create and use new types (enumerations, classes, and structures), and understand the differences between reference types and value types.
- ❖ Use collections to aggregate data, and use Generics to implement type-safe collection classes, structures, interfaces, and methods.
- ❖ Design, document, code and unit test class libraries as part of larger projects like WINFORMS, SQL Server and ADO.NET
- ❖ Create web-based distributed applications using C#, ASP.NET, SQL Server and ADO.NET.
- ❖ Create and debug application and class library solutions and projects.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO 4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2		1	1	2	1			1			1			
CO2	2	2	2		2	1			1			1			
CO3	2	1	2		2							2			
CO4	2	1	3	1	3				2		1	2			
CO5	2	1	3	1	3				1		1	2			
CO6	2	1	1	2	3				1		1	2			

UNIT I

INTRODUCTION to C#: Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

UNIT II

OBJECT ORIENTED ASPECTS OF C#: Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Errors and Exceptions.

UNIT III

WINDOWS APPLICATIONS: Drawbacks of Console Applications, Container Controls, Non Container Controls, Developing Windows Application from Notepad and Visual Studio, Events, Types of Events – Mouse, Focus, Drag, Key and Other Related Events, Building Windows Applications.

ADO.NET: Problems with File Handling, Data Source Communication, Drivers and Providers, Introduction of ADO.NET, ADO.NET Namespaces, ADO.NET Objects, Accessing Data with ADO.NET.

UNIT IV

BUILDING ASP.NET WEB PAGES: HTML form Development, Client side Scripting, Server side Scripting, Web applications and Web servers, HTTP, Advantages Using ASP.NET, ASP.NET Application, ASP.NET Namespaces, ASP.NET Web Page Structure, Creating Sample C# Web Applications, ASP.NET Web Page Execution Architecture, Debugging and Tracing of ASP.NET.

UNIT V

ASP.NET WEB CONTROLS: Web Form Structures, Introduction to Web Form controls, Server Side Controls, Web Server Controls, GET and POST, Page Submission, Web Page Creation Techniques, Redirection between Web Pages, Validation Controls.

UNIT VI

WEB SERVICES: Web Services, Web Service Architecture, WSDL, Building WSDL Web Service.

CONFIGURING .NET ASSEMBLIES: Private Assemblies, Shared Assemblies, and Versioning.

MULTITHREADED PROGRAMMING: Thread Class, Life Cycle of a Thread, Steps for Creating a Thread, Thread Synchronization.

TEXT BOOKS:

- 1) Pro C# 2010 and the .NET 4 Platform, Andrew Trolesen,
- 2) Programming in C#, E. Balagurusamy, Tata McGraw-Hill, 2004.

REFERENCE BOOKS:

- 1) Programming C#, J. Liberty, 2nd Edition., O'Reilly, 2002.
- 2) C# and the .NET Platform, Andrew Trolesen, 2nd Edition, Dreamtech Press
- 3) Sams Teach Yourself the C# Language in 21 Days', Bradley L Jones, 1st edition, 2001.
- 4) Microsoft C# Programming for the Absolute Beginner, Andy Harris, PTR publications, 2002.
- 5) The Complete Reference: C#, Herbert Schildt, Tata McGraw-Hill, 2004.
- 6) Professional C#, Robinson et al, 2nd Edition., WroxPress, 2002.
- 7) C# and the .NET Platform, Andrew Troelsen, A! Press, 2003.
- 8) A Textbook on C#, S. ThamaraiSelvi, R. Murugesan, Pearson Education, 2003.

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III B.Tech. II-Sem (CSE)

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(A0522196) DATA WAREHOUSING AND MINING
(For Branches: ECE & CSE)

COURSE OBJECTIVES:

The main objective of this course is to provide students

- ❖ With the basic data warehousing and data mining concepts
- ❖ To learn mining rules in large databases
- ❖ To get idea on clustering analysis
- ❖ Applications that can enable them to set up and manage an industrial data warehousing and data mining system.
- ❖ To learn about OLTP and OLAP systems

COURSE OUTCOMES:

Upon completion of the course students should:

- ❖ Ability to do Conceptual, Logical, and Physical design of Data Warehouses
- ❖ Familiarity with Requirements Engineering for Data Warehouses
- ❖ OLAP applications and OLAP deployment
- ❖ Have a good knowledge of the fundamental concepts that provide the foundation of data mining.
- ❖ Learn broad classes of data mining technologies
- ❖ Understand how these concepts are engineered to use some of the basic data mining tools.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1		2							1				3	
CO2		1		2	2			2					1		
CO3	2	1				1						2			2
CO4	1			1				2					2		
CO5	1		2											3	
CO6	2		2		1			1							1

UNIT – I

Introduction: What Motivated Data Mining? Why is it Important?; What is Data Mining?; Data Mining-On What Kind of Data?; Data Mining Functionalities: What kinds of Data Can be Mined?; Are all of Patterns Interesting?; Classification of Data Mining Systems; Data Mining task primitives;

Data Warehouse and OLAP Technology: What is a Data Warehouse?; A Multidimensional Data Model: From Tables and Spreadsheet to Data Cubes, Stars, Snowflakes and Fact constellation schemas for Multidimensional Databases, Measures: Their Categorization and Computation, Concept Hierarchies, OLAP operations in the Multidimensional Data Model; Data Warehouse Architecture: Steps for the Design and Construction of Data Warehouses, A three-tier Architecture.

UNIT-II

Data Pre-processing: Why pre-process the data; Descriptive Data Summarization: Measuring the Central Tendency, Measuring the Dispersion of Data, Graphic Displays of Basic Descriptive Data Summaries; Data Cleaning: Missing values, Noisy Data Cleaning as a process; Data Integration and Transformation: Data Integration, Data Transformation, Data Reduction: Data Cube aggregation, attribute subset selection; Dimensionality Reduction, Numerosity Reduction;

UNIT-III

Mining Frequent patterns, Associations, and Correlations: Basic Concepts; Efficient and Scalable Frequent Itemset Mining methods: The Apriori Algorithm, Generating Association Rules from Frequent Itemsets, Improving Efficiency of Apriori, Mining Frequent Itemsets

without Candidate Generation; Mining various kinds of Association Rules: Mining multilevel & multi-dimensional association rules; From Association Mining to Correlation Analysis: Strong Rules are not necessarily Interesting, From Association analysis to Correlation analysis;

UNIT-IV

Classification I: Overview of Classification and Prediction: What is Classification, What is prediction?; Issues Regarding Classification and Prediction: Preparing data for Classification and Prediction, Comparing Classification and Prediction Methods; Bayesian Classification: Bayes' theorem, Naïve Bayesian Classification; Classification by Decision Tree Induction: Decision Tree Induction, Attribute Selection Measures, Tree Pruning, Scalability and Decision Tree Induction; Rule-Based Classification: Using IF-THEN rules for Classification, Rule Extraction from Decision Tree, Rule Induction using a Sequential Covering Algorithm; Classification by Back propagation: A Multilayer Feed-Forward Neural Network, Defining Network Topology, Back propagation;

UNIT-V

Classification II and Prediction: Support Vector Machines: The Case when the Data are Linearly Separable, The Case when the Data are Linearly Inseparable; Lazy Learners: k-Nearest-Neighbour Classifiers, Case-Based Reasoning; Prediction: Linear Regression, Nonlinear Regression; Accuracy and Error Measures: Classifier Accuracy Measures, Predictor Error Measures; Evaluating the Accuracy of a Classifier or Predictor: Holdout Method and Random sub sampling, Cross validation, Bootstrap;

UNIT-VI

Cluster Analysis: Overview of Cluster Analysis; Types of data in Cluster Analysis: Interval-Scaled Variables, Binary Variables, Categorical, Ordinal, and Ratio-Scaled variables, Variables of Mixed Types; A Categorization of Major Clustering Methods; Partitioning Methods: Classical Partitioning Methods: k-Means and k-Medoids, Partitioning Methods in Large Databases: From k-Medoids to CLARANS; Hierarchical Methods: Agglomerative and Divisive Hierarchical Clustering, BIRCH, ROCK; Density-Based Methods: DBSCAN; Grid-Based Methods: STING; Model-Based Clustering Methods: Expectation-Maximization;

TEXT BOOKS:

1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber Harcourt India, second Edition.

REFERENCES:

1. Data Mining Introductory and advanced topics–Margaret H Dunham, Pearson Education
2. Data Mining Techniques – Arun K Pujari, University Press.
3. Data Warehousing in the Real World – Sam Anahory & Dennis Murray. Pearson Edn Asia.
4. Data Warehousing Fundamentals – Paulraj Ponnaiah Wiley Student Edition
5. The Data Warehouse Life cycle Tool kit – Ralph Kimball Wiley Student Edition.

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III B.Tech. II-Sem (CSE)

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(A0523196) ANDROID PROGRAMMING**COURSE OBJECTIVES:**

Upon completion of this course, you will be able to:

- ❖ Build your own Android apps
- ❖ Explain the differences between Android and other mobile development environments
- ❖ Understand how Android applications work, their life cycle, manifest, Intents, and using externalresources
- ❖ Design and develop useful Android applications with compelling user interfaces by using, extending, and creating your own layouts and Views and using Menus.
- ❖ Take advantage of Android's APIs for data storage, retrieval, user preferences, files, databases, and content providers
- ❖ Tap into location-based services, geocoder, compass sensors, and create rich map-based applications

COURSE OUTCOMES:

- ❖ Understand the Android Framework and architecture. Installation on Android studio and its project development environment.
- ❖ Display proficiency in coding on a mobile programming platform and accessing the User Interfaces built-in application tools.
- ❖ Storage tools, Web view and Telephony concepts for the Android platform.
- ❖ Design and develop Multimedia application in android.
- ❖ Create a Mobile app with a significant programming component Tap into Built-in Services.
- ❖ Create a Mobile app with a significant programming component to google map locations, content Provider and dialog box.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1			1		2				1				1		
CO2		1	3		1								1	1	
CO3			1		1			1					1	1	
CO4		1	1		1	1							1	1	
CO5	2		2		1							1	1	2	1
CO6	1		2		1							1	1	2	

UNIT-I

Introduction to Android, Types of Mobile Applications, Android Architecture(About DVM, Linux kernel, Java libraries & Native libraries, application frame work), Android Framework(Activity, Service, Broadcast Receiver, Content Provider), Android Studio Environment(how to Install, install in emulator, real device) Project Structure(R.Java, res folder, manifest.xml and .apk file), Android features, History, Layout UI groups(Leaner Layout, Relative Layout, Table Layout, Frame Layout, Grid Layout), Width and height properties(Match parent, Wrap content, Pixel, Density pixel and Scaled pixel).

UNIT-II

Activity, Activity lifecycle, Life cycle Methods, Intents, Intent Methods, layout file and its child elements and attributes, Basic UI Components(Text View, Button, Edit Text, Radio Button, Check Box), Advanced UI Components (AutoCompleteTextView, Spinner, ListView) Adapters (ArrayAdapter, Custom Adapter), Toast.

UNIT-III

WebView, WebView-HTML Communication, Fragment, Fragment Life Cycle. **Storage Methods:** shared preferences, SQLite Database (insert, read, update, delete). **Telephony:** send SMS, Call, Attaching File, and Send E-Mail.

UNIT-IV

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Multimedia in Android: Media Player, Video View, Audio Recording, Video recording, Camera, Gallery. **Service:** Service, Service lifecycle methods.

UNIT-V

Built-in Services (location service, Notification service, Sensor Service, WIFI Service, Bluetooth Service, Vibrator Service), Broadcast Receivers.

UNIT-VI

Content Provider, Dialog Boxes (Custom dialog, Alert dialog, date Picker, Time Picker, Progress dialog, dialog Fragment), Google Maps.

TEXT BOOKS:

- 1) Android Application Development (with Kitkat Support), Black Book by Pradeep Kothari.
- 2) Android Programming: Pushing the Limits by Erik Hellman.

REFERENCES:

- 1) Beginning Android 4 Application Development by Wei-Meng Lee
- 2) Android Application Development for Dummies by Michael Burton

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III B.Tech. II-Sem (CSE)

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(A0524196) MACHINE LEARNING
(Professional Elective-I)

COURSE OBJECTIVES:

To give students

- ❖ Basic knowledge about the key algorithms and theory that form the foundation of machine learning and computational intelligence
- ❖ A practical knowledge of machine learning algorithms and methods

COURSE OUTCOMES:

They will be able to

- ❖ Understand the principles, advantages, limitations and possible applications of machine learning.
- ❖ Identify and apply the appropriate machine learning technique to classification, pattern recognition, optimization and decision problems.
- ❖ Provides a broad introduction to machine learning, data mining, and statistical pattern recognition.
- ❖ Understands a wide variety of learning algorithms and how to apply them on the data.
- ❖ Understand how to perform evolution of learning algorithms and model selection.
- ❖ Learn not only the theoretical underpinnings of learning but also gain practical know how needed to quickly and powerfully apply these techniques to new problems.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1		2				2				1	1	2
CO2	3						2					1		1	1
CO3	2			2						1		2			1
CO4		3	1			1					2				1
CO5															1
CO6		2	1	1								2			1

UNIT – I

Introduction: Machine perception, pattern recognition example, pattern recognition systems, the design cycle, learning and adaptation.

UNIT – II

Bayesian Decision Theory: Introduction, continuous features – two categories classifications, minimum error-rate classification- zero-one loss function, classifiers, discriminant functions, and decision surfaces.

UNIT – III

Maximum likelihood and Bayesian parameter estimation: Introduction, maximum likelihood estimation, Bayesian estimation, Bayesian parameter estimation–Gaussian case.

UNIT – IV

Un-supervised learning and clustering: Introduction, mixture densities and identifiability, maximum likelihood estimates, application to normal mixtures, K-means clustering. Data description and clustering – similarity measures, criteria function for clustering.

UNIT – V

Component analysis: Principal component analysis, non-linear component analysis; Low dimensional representations and multi-dimensional scaling.

UNIT-VI

Stochastic methods: Introduction, Stochastic search, Boltzmann learning

TEXT BOOKS:

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1. "Pattern classifications", Richard O.Duda, Peter E. Hart, David G. Stroke. Wiley student edition, Second Edition.

REFERENCE BOOKS:

1. "Pattern Recognition and Image Analysis" Earl Gose, Richard John baugh, Steve Jost.
2. "Introduction to Machine Learning" by Ethem Alpaydin, PHI 2nd Edition.

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III B.Tech. II-Sem (CSE)

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(A0525196) CLOUD INFRASTRUCTURE AND SERVICES

(Professional Elective-I)

(For Branches: ECE & CSE)

COURSE OBJECTIVES:

- ❖ Explain the importance and benefits of Cloud computing and the need for its rapid adoption
- ❖ Explain roadmap for transformation from classic to cloud environment
- ❖ Identify and differentiate various infrastructure components of classic and virtualized data center
- ❖ Explain virtualization requirements and available tools at each layer of IT infrastructure
- ❖ Explain business continuity options in a virtualized environment
- ❖ Discuss effective cloud computing deployment model for businesses/IT organizations

COURSE OUTCOMES:

Upon successful completion of this course, participants should be able to:

- ❖ Explain the phases of transition from classic data center to virtual data center and then to the Cloud
- ❖ Describe virtualization technology at server, storage, network, desktop, and application layers of IT infrastructure
- ❖ Explain the key characteristics, services, and deployment models of Cloud
- ❖ Describe the Cloud infrastructure components and service management processes
- ❖ Describe Cloud security concerns and solutions
- ❖ List the key considerations for migration to the Cloud

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1		1				1	1		1			
CO2	3	1	2		2				2	3		1			
CO3	2	1	1		1				1	2		1			
CO4	1	1	1		1				1	2		1			
CO5	3	3	3		3				2	1		1			
CO6	1	2	1		2				1	1		1			

UNIT I:

Journey to the Cloud: This unit focuses on the business drivers, definition, essential characteristics, and phases of journey to the Cloud. Business drivers for Cloud computing, Definition of Cloud computing, Characteristics of Cloud computing as per NIST, Steps involved in transitioning from Classic data center to Cloud computing environment.

UNIT II:

Classic Data Center (CDC); This unit focuses on the key elements of CDC – compute, storage, and network, with focus on storage networking, business continuity, and data center management. Application, DBMS, Compute, Storage and Networking, Object based and Unified storage technologies, Business continuity overview and backup, Replication technologies, CDC Management.

UNIT III:

Virtualized Data Center (VDC) – Compute and Storage: VDC Compute: compute aspect of the VDC, fundamental concepts of compute virtualization and techniques, virtual machine (VM) components and management of compute resources, process to convert physical machine to VM.

VDC Storage: storage virtualization implementation, key underlying technologies, methods for providing virtual storage to compute systems in a VDC environment.

UNIT IV:

Virtualized Data Center (VDC) – Networking and desktop applications: VDC Networking: network virtualization in VDC, VDC network infrastructure and components, virtual LAN, and virtual SAN. key network traffic management techniques.

VDC Desktop and Application: the various aspects of desktop and application virtualization technologies.

Business Continuity in VDC: concepts and techniques employed for ensuring business continuity, mechanisms to protect single point of failure, various technology options for backup, replication, and migration of VMs and their data, various options for recovering from total site failure due to a disaster.

UNIT V:

Cloud Computing and Infrastructure: Cloud Computing Primer: essential characteristics of Cloud Computing, Cloud services and deployment models, the economics of Cloud.

Cloud Infrastructure and Management: Cloud infrastructure components, Cloud service creation processes. Cloud service management processes, delivery of Cloud services is aligned with business objectives, expectations of Cloud service consumers.

UNIT VI:

Cloud Security and Migration to cloud: Cloud Security: Security concerns and counter measures in a VDC and Cloud environment, Key security concerns and threats, infrastructure security mechanisms in VDC and cloud environments, access control, identity management, governance, cloud security best practices.

Cloud Migration Considerations: considerations for migration to the cloud, details ‘cloud models’ suitable for different categories of users, governance, risk and compliance aspects in Cloud, considerations for choosing applications suitable for Cloud, different phases to adopt the Cloud.

TEXT BOOKS:

1. **Cloud Computing: A Practical Approach** Author: Anthony T. Velte, Publisher: Tata Mcgraw Hill Education Private Limited (2009), ISBN: 0070683514

REFERENCE BOOKS:

1. **Cloud Computing For Dummies** Author: Halper Fern, Kaufman Marcia, Bloor Robin, Hurwit Judith, Publisher: Wiley India Pvt Ltd (2009), ISBN: 8126524871

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY
AUTONOMOUS
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

III B.Tech. II-Sem (CSE)

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(A0526196) PRINCIPLES OF PROGRAMMING LANGUAGES

(Professional Elective-I)

COURSE OBJECTIVES:

- ❖ The main objective is that students will have a deep, working knowledge of the functional paradigm and the key ideas used in modern programming languages. It provides an exposure to core concepts and principles in contemporary programming languages

COURSE OUTCOMES:

- ❖ Apply the parse tree, ambiguity, semantics and syntax of a grammar and understanding the programming domains.
- ❖ Understanding arrays of different programming languages and variables.
- ❖ Understanding the statements, parentheses and control statements of different programming language.
- ❖ Apply the concepts of subprograms of programming languages.
- ❖ Understanding the Abstract data types and designs various kinds of programming languages.
- ❖ Understanding the logic programming and functional programming.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2						2			1	1	1	
CO2	2	1	1						1			2		2	1
CO3	1											2		2	2
CO4	2	1	1						1			2		2	1
CO5	2	1	2						1			1		2	
CO6	2	1							1					1	

UNIT I

Preliminary Concepts: Reasons for studying concepts of programming languages, Programming domains, Language Evaluation Criteria Influences on language design ,Language categories, Language Design Trades-Offs, Implementation Methods, Programming Environments Syntax and Semantics: general Problem of describing Syntax and Semantics, Formal Methods of Describing Syntax-BNF,EBNF.

UNIT II

Data types: Introduction, primitive, character, user defined, array, associative, record, union, design and implementation uses related to these types. Names, Variable, type checking, strong typing, type compatibility.

UNIT III

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

UNIT IV

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, Design issues of subprograms and operations, parameter passing methods, generic sub-programs, user defined overloaded operators, co routines.

UNIT V

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, language examples, object oriented programming in small talk, C++, Java, C#. Exception handling: Exceptions, exception Propagation, Exception handler in Java, Ada.

UNIT VI

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Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming. Functional Programming Languages: Introduction, fundamentals of FPL, The first FPL: LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

TEXT BOOKS:

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

REFERENCES:

1. Programming Languages, Second Edition, A.B. Tucker, R.E. Noonan, TMH.
2. Programming Languages, K. C. Louden, Second Edition, Thomson, 2003.
3. LISP, Patric Henry Winston and Paul Horn, Pearson Education.
4. Programming in Prolog, W.F. Clocksin and C.S. Mellish, Fifth Edition, Springer.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

III B.Tech. II-Sem (CSE)

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(A0527196) IMAGE PROCESSING
(Professional Elective-I)

COURSE OBJECTIVES:

- ❖ To learn the fundamentals of Image Processing.
- ❖ To learn sampling and reconstruction procedures.
- ❖ To learn the various transforms used in image Processing.
- ❖ To study various concepts of image enhancement, reconstruction and image compression.
- ❖ To design image processing systems.

COURSE OUTCOMES:

- ❖ Understand Image Representation and modeling
- ❖ Apply Image Transformation methods
- ❖ Implement Image processing algorithms
- ❖ Implement Image Segmentation algorithms
- ❖ Apply the Image processing algorithms for object recognition and detection

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1		2				2	3					
CO2	2	2	1		3				2	3					
CO3	3	3	2		3				3	3					
CO4	2	3	2		3				3	3					
CO5	3	3	3		3			3	3	3	3	3			

UNIT - I

Digital Image Fundamentals -- image model, image sampling and quantization, basic relationships between pixels, neighbors, distance measures – linear and nonlinear operations.

UNIT - II

Image enhancement in the spatial domain: gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters, combining the spatial enhancement methods.

UNIT – III

Image enhancement in the frequency domain: Fourier transform – one dimensional, two dimensional DFT, filtering – Smoothing frequency domain filters - lowpass filters – highpass filters – Homomorphic filtering.

UNIT-IV

Image restoration : A model of the image degradation/restoration process, noise models, restoration in the presence of noise–only spatial filtering, Wiener, constrained least squares filtering, geometric transforms.

UNIT - V

Image Compression: Fundamentals, image compression models, error-free compression, Lossy compression, Lossy predictive coding, transform coding, Wavelet Coding, image compression standards.

UNIT - VI

Image Segmentation: Detection of discontinuous, edge linking and boundary detection, thresholding, region–based segmentation, segmentation by morphological watersheds.

TEXT BOOK:

1. Digital Image processing – R.C. Gonzalez & R.E. Woods, Addison Wesley/ Pearson education, 2nd Edition, 2002.
2. Digital image processing by S.Jayaraman, S.Esakkirajan & T.Veera Kumar, Tata McGraw Hill, 2010.

REFERENCES:

1. Fundamentals of Digital Image processing – A.K.Jain , PHI.
2. Digital Image processing using MAT LAB – Rafael C. Gonzalez, Richard E Woods and Steven L. Edition, PEA, 2004.
3. Digital Image Processing – William K. Pratt, John Wiley, 3rd Edition, 2004.
4. Fundamentals of Electronic Image Processing – Weeks Jr., SPIC/IEEE Series, PHI.

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III B.Tech. II-Sem (CSE)

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(A0528196) AGILE SOFTWARE DEVELOPMENT

(Open Elective-1)

COURSE OBJECTIVES:

- ❖ This course makes student learn the fundamental principles and practices associated with each of the agile development methods. To apply the principles and practices of agile software development on a project of interest and relevance to the student

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

- ❖ Understand the nature of agile software development to establish a professional software development environment and build teams
- ❖ Analyze the customer role related problems in agile development environments.
- ❖ Analyze the time related problems in agile development environments
- ❖ Apply measures for quality assurance
- ❖ Apply measures for quality assurance and Test Driven Development in agile software development environments
- ❖ Analyze the abstraction levels in agile software development and develop trust among team members in learning environment.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2			2				2	3			1	2	2
CO2	1				3				2	3			1	2	2
CO3	1	2	1		3				3	3		2	1		2
CO4												2			2
CO5	2	2	1		1				3	2		2	2		2
CO6	1				2				2	2			1	2	1

UNIT-I

Introduction to Agile Software Development-Overview, Objectives, Three Perspectives on Software Engineering, The Agile Manifesto, Application of Agile Software Development, Data About Agile Software Development, Agile Software Development in Learning

UNIT-II

Environments Teamwork- Overview, Objectives, A Role Scheme in Agile Teams, Dilemmas in Teamwork, Teamwork in Learning Environments

Customers and Users- Overview, Objectives, The Customer, The User, Customers and Users in Learning Environments

UNIT-III

Time- Overview, Objectives, Time-Related Problems in Software Projects, Tightness of Software Development Methods, Sustainable Pace, Time Management of Agile Projects, Time in Learning Environments

UNIT-IV

Measures- Overview, Objectives, Why Are Measures Needed?, Who Decides What Is Measured?, What Should Be Measured?, When Are Measures Taken?, How Are Measures Taken?, Who Takes the Measures?, How Are Measures Used?, Case Study- Monitoring a Large-Scale Project by Measures, Measures in Learning Environments.

UNIT-V

Quality- Overview, Objectives, The Agile Approach to Quality Assurance, Test-Driven Development, Measured TDD, Quality in Learning Environments.

Learning- Overview, Objectives, How Does Agile Software Development Support Learning Processes, Learning in Learning Environments

UNIT-VI

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Abstraction- Overview, Objectives, Abstraction Levels in Agile Software Development, Abstraction in Learning Environments Trust- Overview, Objectives, Software Intangibility and Process Transparency, Game Theory Perspective in Software Development, Ethics in Agile Teams, Diversity, Trust in Learning Environments

TEXT BOOK(S):

- 1) Hazza and Dubinsky, Agile Software Engineering, Series: Undergraduate Topics in Computer Science, Springer, 2009.

REFERENCE BOOKS:

- 1) Craig Larman, Agile and Iterative Development: A Managers Guide, Addison-Wesley, 2004.
- 2) Kevin C. Desouza, Agile Information Systems: Conceptualization, Construction, and Management, Butterworth-Heinemann, 2007.

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III B.Tech. II-Sem (CSE)

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(A0529196) OBJECT ORIENTED ANALYSIS AND DESIGN

(Open Elective –1)

COURSE OBJECTIVES:

- ❖ Building block of UML: things , relationships and diagrams
- ❖ Contents and common modelling techniques to model static aspects of any system using: Class diagrams, object diagrams, deployment diagram, use case diagram
- ❖ Contents and common modelling techniques to model dynamic aspects of any system using: sequence diagram, collaboration diagram, activity diagram, state chart diagram
- ❖ Contents and common modelling techniques to model any system using component diagram to implement physically.

COURSE OUTCOMES:

- ❖ Analyze system requirements and model problem domains
- ❖ Evaluate quality of analysis
- ❖ Design and build object oriented systems
- ❖ Designs based on design principles patterns and heuristics
- ❖ Object-oriented code to correctly implement a design
- ❖ Read and write analysis and design documentation the Unified Modeling language

MAPPING WITH COs&POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	1	2	1		3			2			1	2	3	2	
CO2	1		2	1				3			2		1	1	
CO3	3			2					2		1			2	2
CO4		2		1				1		3		2	2	1	
CO5	2		1		3		2						1		1
CO6	1		2			1				2		3		1	1

UNIT – I

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

UNIT - II

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

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

UNIT - III

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

Basic Behavioral Modeling-: Interactions, Interaction diagrams. Use cases, Use case Diagrams, Activity Diagrams.

UNIT - IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT-V

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

UNIT - VI

Case Study: The Unified Library application, ATM application.

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson: The Unified Modeling Language User Guide, Pearson Education.

REFERENCE BOOKS:

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1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
2. Pascal Roques: Modeling Software Systems Using UML2, WILEYDreamtech India Pvt. Ltd.
3. AtulKahate: Object Oriented Analysis & Design, The McGraw – Hill Companies.
4. Mark Priestley: Practical Object-Oriented Design with UML, TATAMcGrawHill
5. Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.
6. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

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III B.Tech. II-Sem (CSE)

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(A0530196) COMPUTER GRAPHICS
(Open Elective-1)

COURSE OBJECTIVES:

This course is designed to provide a comprehensive introduction to computer graphics leading to the ability to understand contemporary terminology, progress, issues, and trends.

- ❖ The interdisciplinary nature of computer graphics is emphasized in the wide variety of examples and applications.
- ❖ Course material is structured to meet the needs of both designers and users of interactive computer graphics systems
- ❖ Provide an understanding of how a computer draws the fundamental graphics primitives - lines and filled polygons in both 2-D and 3-D.
- ❖ Understand the fundamental mathematics involved in generating a 3-D scene. Includes coordinate systems, transformations, and vector operations.
- ❖ Understand the 3-D graphics pipeline, i.e. the steps taken to transform and draw an object. This includes 3-D transformations, lighting and shading, rasterization and texture mapping. Programmable shaders will be introduced.

COURSE OUTCOMES:

Upon completion of the course students will be able to:

- ❖ Draw primitive objects (lines, circles, polygons) on a display.
- ❖ Demonstrate an understanding of contemporary graphics hardware. Be exposed to graphical input and output devices
- ❖ Master 2D & 3D modelling and transformations.
- ❖ Apply projection of 3-D objects on a 2-D plane.
- ❖ Master clipping, fill, and rendering techniques and be exposed to color and shading models.
- ❖ Understand the concepts of Animation techniques and languages

MAPPING WITH COs&POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3			2	1							1	1	3	2
CO2		2			3						1		2	1	3
CO3			3	3			1	2					3	1	2
CO4	3	2			1								2	1	3
CO5		2		3				1					1	2	3
CO6									2	3		1	3	2	1

UNIT I

A Survey of Computer Graphics: Overview of graphics systems: Video-Display Devices, Raster-scan Systems, Random-scan Systems, Graphics Monitors and Work stations, Input devices, Hardcopy Devices and Graphics Software.

UNIT II

Output Primitives: Points and lines, Line drawing algorithms- DDA, Bresenham's line algorithm, Circle generation algorithm and Ellipse Generating algorithms.

UNIT III

2-D Geometrical transforms: Basic Transformations, Matrix representations and Homogeneous coordinates, Composite transforms, Other Transformations, Transformations between coordinate systems.

UNIT IV

2-D Viewing: Definition of view port, clipping and window. The Viewing Pipeline, Viewing coordinate reference frame, Window to View-port coordinate transformation, 2D Viewing functions, Clipping Operation, Point Clipping, Line Clipping: Cohen-Sutherland and

Liang - Barsky line clipping algorithms, Polygon Clipping: Sutherland – Hodgeman polygon clipping algorithm.

UNIT V

3-D Geometric and Modelling Transformations: Translation, Rotation, Scaling, other Transformations, Composite Transformations.

UNIT VI

3-D viewing: Viewing Pipeline, Viewing coordinates, Projections.

Computer Animation: Design of Animation Sequence, General Computer Animation functions, Raster Animation, Computer Animation Languages, Key-Frame systems, Motion Specifications.

TEXT BOOKS:

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

REFERENCES:

1. “Computer Graphics Principles & practice”, second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.
2. “Computer Graphics Second edition”, Zhigand xiang, Roy Plastock, Schaum’s outlines, Tata Mc Graw hill edition.
3. “Procedural elements for Computer Graphics”, David F Rogers, Tata Mc Graw hill, 2nd edition.

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III B.Tech. II-Sem (CSE)

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(A0531196) INTERNET OF THINGS

(Open Elective –I)

(For Branches: ECE & CSE)

COURSE OBJECTIVES: The Students will learn the following:

- ❖ To understand how we make our surroundings smart with the help of internet
- ❖ To understand basic technologies and concepts behind smart world
- ❖ To understand the architecture and hardware technologies of Internet of Things (IoT)
- ❖ To understand practical examples for IoT

COURSE OUTCOMES: Upon the successful completion of the course, the student will be able:

- ❖ To understand the architecture of Internet of Things and connected world
- ❖ To understand how to use various hardware, communication and sensing technologies to build IoT applications
- ❖ To understand real time IoT Environments that make our world super smart.
- ❖ To understand of deploying various types of analytics on machine data to define context, find faults, ensure quality, and extract actionable insights.
- ❖ To understand IOT protocols for better connectivity.
- ❖ To understand challenges and future trends in IoT.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3						2	2		2	3		2
CO2	1	2		2					2	3	1	1		2	3
CO3	2	2				3			2			2	2		2
CO4		3		1	2				2	2			2	2	3
CO5		2	2								2	2	3		
CO6	3	1											2		2

UNIT I:

Introduction to Internet of Things: Introduction, Definition of IoT, IoT Architectures-5G Architecture, Architecture IoT for using mobile Devices, layer Architecture for IoT, Protocol Architecture for IoT.

Internet of Things Applications: Smart Cities, Smart Energy and smart Grid, Traffic Management and Transportation, Smart Home, Smart Building and Infrastructure, Smart factory and smart manufacturing, Smart Healthcare, and Sports.

UNIT II:

Infrastructure and Services: Infrastructure Protocols, Bluetooth low energy, Device or Service Discovery for IoT, Protocols for IoT Service Discovery, Prominent IoT Service Discovery Products Available in the Market.

UNIT III:

The Integration Technologies and Tools for IoT Environments: IoT Communication Protocol Requirements, Smart Enterprises and Environments, Sensor and Actuator Networks, The IoT Device Integration Concepts, Standards, and Implementations, Device Profile for Web Services, Device Integration Protocols and Middleware.

UNIT IV:

The Enablement Platforms for IoT Applications and Analytics: The IoT Building Blocks, The Architectural Building-Blocks, IoT Applications and Platforms, The IoT Data Analytics Platforms.

UNIT V:

IoT Protocols Convergence: Message Queue Telemetry Transport, Constrained Applications Protocol, Advanced Message Queuing Protocol, Java Message Service API,

Data Distribution Service, Representational State Transfer, Extensible Messaging and Presence Protocol.

UNIT VI:

Future Trends and Research challenges: OpenIoT- Project Design and Implementation, Execution and Implementation Issues, Project Results, Acceptance and Sustainability.

Related future Internet Technology: Cloud Computing, IoT and Semantic Technologies,

TEXTBOOKS:

- 1) Internet of Things – Principles and Paradigms, Rajkumar Buyya and Amir Vahid Dastjerdi, Toddgreen Publishers, 2016.
- 2) Internet of Things – From Research and Innovation to Market Deployment, Ovidiu Vermesan, Peter Friess, River Publishers, 2014

REFERENCES:

- 1) Internet of Things -Converging Technologies for Smart Environments and Integrated Ecosystems, Ovidiu Vermesan, Peter Friess
- 2) The Internet of Things: Key Applications and Protocols, Olivier Hersent, David Boswarthick, Omar Elloumi, Wiley, 2012
- 3) Building the Hyperconnected Society, Ovidiu Vermesan, Peter Friess, River Publishers, 2015
- 4) M2M Communications: A Systems Approach, By David Boswarthick, Omar Elloumi, Olivier Hersent, Wiley, 2012
- 5) Designing the Internet of Things, Adrian McEwen, Hakim Cassimally, Wiley, 2014
- 6) Internet of Things in Industries: A Survey, Li Da Xu, Wu He and Shancang Li, IEEE Transactions on Industrial Informatics, vol. 10, no. 4, November 2014

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III B.Tech. II-Sem (CSE)

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(A0018194) CONSTITUTION OF INDIA
(Mandatory Learning Course-III)
(For Branches CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

Students will be able to

- ❖ Study the structure and composition of Indian Constitution
- ❖ Learn about the federalism in the Indian context.
- ❖ Study the Panchayathi Raj Institutions as a medium of decentralization
- ❖ Learn about the three organs of the state in the contemporary scenario.

COURSE OUTCOMES:

Students will be able to

- ❖ Understand historical background of the constitutional making and its importance for building a democratic India.
- ❖ Be aware of the History, features of Indian constitution, the role Governor and Chief Minister, role of state election commission, the decentralization of power between central, state and local self-government.
- ❖ Aware of Indian government, the structure of state government, the local Administration.
- ❖ Able to evaluate Preamble, Fundamental Rights and Duties, Zilla Panchayat, block level organization, various commissions.

UNIT I

History of Indian Constitution: History of Making of the Indian Constitution - History Drafting Committee - Composition & Working of Constitution.

UNIT II

Philosophy of the Indian Constitution: Preamble Salient Features of Indian Constitution.

UNIT III

Contours of Constitutional Rights & Duties: Fundamental Rights: Right to Equality - Right to Freedom - Right against Exploitation - Right to Freedom of Religion - Cultural and Educational Rights - Right to Constitutional Remedies - Directive Principles of State Policy.

UNIT IV

Organs of Governance: Parliament - Composition - Qualifications and Disqualifications Powers and Functions of Executive - President - Governor - Council of Ministers – Judiciary – Qualifications, Appointment and Transfer of Judges.

UNIT V

Local Administration: Role and Importance of Municipal Corporation Role and Importance Pachayati raj: Role and Importance Zilla Pachayat: Position and role - Village level: Role of Elected and Appointed officials - Importance of grass root democracy.

UNIT VI

Election Commission: Role and Functioning of Election Commission Role and Functioning of Chief Election Commissioner and Election Commissioners - Role and Functioning of State Election Commission.

TEXT BOOKS

- 1) Introduction to Constitution of India, D.D. Basu, Lexis Nexus
- 2) The Constitution of India, PM Bhakshi, Universal Law

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III B.Tech. II-Sem (CSE)

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(A0532196) CAMPUS TO CORPORATE
(Skill Development Course-IV)
(For Branches: ECE & CSE)

COURSE OBJECTIVES:

- ❖ To make the students aware of the GD session in selection process
- ❖ To learn the art of presentation and organizing meetings
- ❖ To learn about the benefits of team work at the work place
- ❖ To learn the process of interviews and also extempore sessions
- ❖ To motivate the students with the help of popular motivational stories

COURSE OUTCOMES:

- ❖ The students can develop leadership skills, communication skills, interpersonal skill, analytical and lateral thinking.
- ❖ To apply the principles of a good presentation and develop the art of presenting effectively.
- ❖ The student can be a good team player by learning about the advantages of team building.
- ❖ The student would be able to perform well in interviews and extempore sessions.
- ❖ The student also learns the importance of leadership themes by successful stories.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1		2	1		1		1		3	1			3	1
CO2							1		1	2		2		1	
CO3				1	2			2			1				
CO4			2		1	1				2					2
CO5						2		1	3			1		1	

UNIT-I

Group Discussion: Introduction – Concept of GD, Types of GD's, Importance of GD in selection, Do's and Don'ts in GD -GD Tips- Difference between GD and Debate - Mock GD's and Debate - Practical session on GD.

UNIT-II

Presentation Skills: Presentation & Evaluation - Just a minute speeches - Creating a power point presentation - Body language – Conclusions -Planning a meeting-Analyzing a meeting-Analyzing agendas-Round table discussions-Small group presentation-Shaking hands-Logging silences-Talent search-To speak or not to speak-relationships

UNIT-III

Team Work Skills: Dimensions of team building-Components of team building-Purpose of teams-Building blocks for team-Types of team-Team leader skills

UNIT-IV

Interview Skills: Introduction – concept – Types of Interviews – Characteristics of Interviewer –Characteristics of Interviewee – Recruitment interview – Appraisal interview – Research interview

UNIT – V

Extempore: Introduction to Extempore - Common Extempore Topics – SWOT Analysis

UNIT – VI

Leadership Content Themes: Leader – Characteristics – Leader Vs. Manager – Leadership styles – Entrepreneur leadership style – Role of Women as leaders – Success stories of Leadership.

REFERENCE BOOKS:

1. Master the Group Discussion & Personal Interview by Sheetal Desarda, Notion Press
2. Leadership wisdom by Robin Sharma
3. Organisational Behaviour, Stephen P. Robbins, Pearson Education
4. Principles of Management, Koontz, Weihrich and Aryasri, Tata McGraw Hill, 2004.

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(A0585196) C# & .NET FRAMEWORK LAB**COURSE OBJECTIVE:**

- ❖ The student will gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the Framework.
- ❖ The student will gain programming skills in C# both in basic and advanced levels.
- ❖ By building sample applications, the student will get experience and be ready for large-scale projects.

COURSE OUTCOMES:

- ❖ Write, compile and debug programs in C# language.
- ❖ To learn the basics of object oriented programming.
- ❖ To get knowledge of windows programming.
- ❖ To get knowledge on server side programming.
- ❖ To gain knowledge on web services and dynamic link libraries.

MAPPING WITH COs&POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	1	1	1	1	2	1			1	1		2	2	2	2
CO2	2	2	1	1	2				1		1	2	1	2	1
CO3	2	2	2	2	2	1			2			2	1	1	1
CO4	2	2	1	1	3				1	1		2		2	1
CO5	2	2	2	2	2	1			2			1	1	2	2

LAB-1

1. Write a program to C# to find the smallest single digit factor for a given value.
2. Write a program in C# to print a number if it is prime; otherwise display the largest factor of that number.
3. Write a program in C# to find the magnitude of a number.

LAB-2

4. Write a C# program for addition and multiplication of two matrices.
5. Write a C# program to display the digits of an integer in words.
6. Write a C# program to which reads a set of strings into the rows a two dimensional array and then prints the string having more number of vowels.

LAB-3

7. Write a C# programs to demonstrate the concepts of Structures and Enumerations.
8. Write a C# programs to demonstrate the concepts of Constructors and Inheritance.
9. Write a C# programs to demonstrate the concepts of Polymorphism.

LAB-4

10. Write a C# programs to demonstrate the concepts of Partial classes and Extension methods.
11. Write a C# programs to demonstrate the concepts of Delegates.

LAB-5

12. Write a C# programs to demonstrate the concepts of Label, Text Box and Button controls.
13. Write a C# programs to demonstrate the concepts of Combo Box and List Box controls.

LAB-6

14. Create a Windows application in C# for registration form and fill the details and when you click the submit button it display the details in the message box.
15. Create a Windows application in C# having two text boxes and three buttons named as factorial, prime, factorial series. When you click any button the resultant value will be displayed on the second textbox.

LAB-7

16. Create a ADO.NET application in C# to verify if the connection is established with OLEDB and MS-ACCESS.
17. Create a ADO.NET applications in C# to demonstrate the Data Reader, Data Set, Data Adapter and Data View Objects.

LAB-8

18. Develop the Static Web pages using HTML and some validations along with Java Script.
19. Design an ASP.NET Webpage to demonstrate the Label, Button and Textbox controls.

LAB-9

20. Design an ASP.NET Webpage to work with Cross page and Post back Submissions.
21. Design an ASP.NET Webpage to work with Dropdown list and ListBox controls.

LAB-10

22. Develop a Registration Form with all Validation Controls.
23. Create a Web Service for all Arithmetic operations.

LAB-11

24. Write a C# program to implement Assemblies.
25. Write a C# program to implement Multi-Threading and Thread Synchronization.

REFERENCES:

- 1) Programming in C#, E. Balagurusamy, Tata McGraw-Hill, 2004.
- 2) Programming C#, J. Liberty, 2nd Edition, O'Reilly, 2002.
- 3) C# and the .NET Platform, Andrew Trolesen, 2nd Edition, Dreamtech Press
- 4) Sams Teach Yourself the C# Language in 21 Days', Bradley L Jones, 1st edition, 2001.

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(A0586196) ANDROID PROGRAMMING LAB**COURSE OBJECTIVES:**

- ❖ Understand how Android applications work, their life cycle, manifest, Intents, and using externalresources
- ❖ Design and develop useful Android applications with compelling user interfaces by using, extending, and creating yourown layouts and Views and using Menus.
- ❖ Secure, tune, package, and deploy Android applications
- ❖ Use Android's communication APIs for SMS, telephony, network management, and internet resources(HTTP).

COURSE OUTCOMES:

- ❖ Display proficiency in coding on a mobile programming platform.
- ❖ Understand the limitations and features of developing for mobile devices.
- ❖ Creating a complete Mobile app with a significant programming component, involving the sensors andhardware features of the phone.
- ❖ Practice existing state of mobile app development via researching existing apps, meeting with industryprofessionals, and formulating new ideas.
- ❖ Display proficiency in coding on a mobile programming platform.
- ❖ Good knowledge of economics and features of the app marketplace by offering the app for download.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1		2	1							3			1	1	
CO2	1							3			2		2	3	1
CO3		1							2		1		2	1	2
CO4				1			2						1		1
CO5	2		1		3									1	1
CO6						1				2			2	2	2

EXPERIMENTS:

- 1) a) Create an android application to display RGM CET Text Message.
b) Create an android application to display RGM CET Message by using Button.
- 2) Create an android application to call different activities by using Implicit and Explicit Intents.
- 3) a) Create an android application to select item from given list by using Auto Complete Text View (ACTV).
b) Create an android application to display dropdown menu items and pick one item by using Spinner Component.
- 4) a) Create an android application to display internal storage data using Array Adapter.
b) Create an android application to display internal storage data in vertical format by using Custom Adapter.
- 5) Create an android application to display WhatsApp videos in grid view by using Custom Adapter.
- 6) Create an android application to display webpage by using Web view Component.
- 7) Create an android application to display different webpages in fragments by using Fragments Component.
- 8) Create an android application to store the data by using Shared Preferences.
- 9) Create an android application to demonstrate concept of SQLite Database Storage method.
- 10) Create an android application to perform different types of operations (Send SMS, Making call and sending email) by using Telephony app.
- 11) Write an android program to develop Media player application.

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- 12) a) Write an android program to develop Video view application
b) Write an android program to develop Audio Recording application.
- 13) a) Write an android program to develop Video Recording application.
b) Write an android program to develop Camera and Gallery application.
- 14) a) Create an android application to get latitude and longitude value by using Location Service.
b) Create an android application to display X, Y Sensor values by using Sensor Service.
- 15) a) Create an android application to get the notifications on Notification Bar by Using Notification Service.
b) Create an android application to display available Wi-Fi devices and Paired Wi-Fi devices by using Wi-Fi Service.
- 16) a) Create an android application to get the Bluetooth devices and list of devices using Bluetooth and Vibrator Service.
b) Create an android application to get the System Announcements by using Broadcast Receiver.
- 17) Create an android application to share the data between multiple applications by using Content Provider.
- 18) Create an android application to display different Dialog Boxes.
- 19) Create an android application to display current location on Google maps by using Google-Maps Service.

REFERENCES:

- 1) Android Application Development (with Kitkat Support), Black Book by Pradeep Kothari.
- 2) Beginning Android 4 Application Development by Wei-Meng Lee.
- 3) Android Application Development for Dummies by Michael Burton

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(A0537197) SOFTWARE TESTING METHODOLOGIES AND TOOLS

BACKGROUND:

Software testing is an integral and important activity in every software development environment. Software seems to have permeated almost every equipment that we use in our daily lives. This course is designed to enable a clear understanding and knowledge of the foundations, techniques, and tools in the area of software testing and its practice in the industry. The course will prepare students to be leaders in software testing. Whether you are a developer or a tester, you must test software. This course is a unique opportunity to learn strengths and weaknesses of a variety of software testing techniques.

COURSE OBJECTIVES:

Upon successful completion of this course students will be able to:

- ❖ Understand the basic concepts of software testing.
- ❖ Understand the various techniques and strategies of software testing and inspection and pointing out the importance of testing in achieving high-quality software.
- ❖ Perform effective and efficient structural testing of software.
- ❖ Integrate and test the various units and components of a software system.
- ❖ Perform effective and efficient functional testing of software.
- ❖ Select the appropriate tests to regression test your software after changes have been made.
- ❖ Plan, track and control the software testing effort.
- ❖ Understand the need of automated testing tools and various kinds of automated testing tools.

COURSE OUTCOMES:

- ❖ To understand the various techniques and strategies of software testing and inspection and pointing out the importance of testing in achieving high-quality software.
- ❖ To have an ability to apply software testing knowledge and engineering methods.
- ❖ To have an ability to design and conduct a software test process for a software testing project.
- ❖ To have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.
- ❖ To have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1			3						2		3				
CO2		3							2		3				
CO3	1	2	2						1		1				
CO4	2	3							2		1				
CO5	1	2	2						3		2				
CO6	1	2	1	1			1				1				

UNIT I :

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

UNIT II:

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

UNIT III:

Dataflow testing:-Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT IV:

Logic Based testing: Overview, decision tables, path expressions, KV charts, and specifications

UNIT V:

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

UNIT VI:

Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, Overview of Some Commercial Testing Tools: Win Runner, Load Runner, QTP, Selenium

TEXT BOOKS:

1. Software testing techniques - Boris Beizer, 2nd Edition, Dreamtech.

REFERENCE BOOKS:

1. Software Testing in the Real World – Edward Kit, Pearson.
2. Effective methods of Software Testing, Perry, John Wiley.
3. Art of Software Testing – Meyers, John Wiley.
4. Software testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.

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(A0538197) HUMAN COMPUTER INTERACTION

(Open Elective-II)

COURSE OBJECTIVES:

- ❖ To expose students to the central concepts of Human-Computer Interaction.
- ❖ Establish target users, functional requirements, and interface requirements for a given computer application.
- ❖ Describe and explain user interface design principles, and apply them to designing an interface.
- ❖ Evaluate user interface designs through usability inspection and user models.
- ❖ Develop user studies and analyze study data to gain information about users, tasks, and interface designs.

COURSE OUTCOMES: The Student will be able to:

- ❖ Apply HCI principles and a user-centered approach to interaction design.
- ❖ Student can analyse user needs and requirements.
- ❖ They can able to Design and develop prototypes based on user assessments (needs and requirements), while applying HCI principles and models.
- ❖ Apply evaluation and usability testing methods to interactive products to validate design decisions.
- ❖ Categorize, design and develop information in proper architectural structures.
- ❖ Create interface design prototypes based on a range of design principles and user data, and user assessments.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1			3		2		1	2		1			
CO2	1	2			1		1		1	1					
CO3	2	1			2				2	2		1			
CO4	2	3			3				1	1					
CO5	1	1			2				1	2					
CO6	2	2			2		1		1	1		1			

UNIT I:

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

UNIT II:

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

UNIT III:

Design process – Understanding Human interaction with computers, Importance of human characteristics in design, Human consideration in Design, Human interaction speeds.

UNIT IV:

Screen Designing: Human Considerations in Screen Design – Interface Design Goals, Screen Meaning and purpose, organizing screen elements clearly and Meaningfully, Ordering of screen data and content – Screen navigation and flow – Visually pleasing composition – Amount of information – Focus and Emphasis – Presenting information simply and meaningfully – statistical graphics – Technological consideration in interface design.

UNIT V:

Windows: Select the Proper Kinds of Windows: Window Characteristics, Components of a Window, Window Presentation Styles, Types of Windows, Window Management, Window

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Operations. Select the Proper Device-Based Controls: Characteristics of Device-Based Controls, Selecting the Proper Device Based Controls.

UNIT VI:

Components: Choose the Proper Screen-Based Controls – Operable Controls, Text Entry, Selection Controls, Combination Entry/selection controls, Other Operable Controls, Custom Controls, and Presentation Controls. Write Clear Text and Messages – Words, Sentences, Messages and Text, Text for Web Pages. Icons, Multimedia, Color-What Is It? Color Uses, possible problems with colors, choosing colors.

TEXT BOOKS:

1. The essential guide to user interface design, Wilbert O Galitz, 3rd Edition, Wiley India, 2007.

REFERENCES:

1. Human – Computer Interaction. ALAN DIX, JANET FINCAY, GRE GORYD, ABOWD, RUSSELL BEALG, PEARSON.
2. Interaction Design PRECE, ROGERS, SHARPS. Wiley Dreamtech,
3. User Interface Design, Soren Lauesen, Pearson Education.

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(A0539197) CYBER SECURITY

(Open Elective-II)

(For Branches: ECE & CSE)

COURSE OBJECTIVES:

- ❖ This course provides insight knowledge about cyber crime and it portrays preventive measures the security policies and procedures that must be adapted to prevent the end user from cyber threats. It also conveys a basic knowledge on the how to analyze the cyber incidents through cyber forensic methods.

COURSE OUTCOMES:

- ❖ Students will be able to gain the knowledge on cyber crime and the challenges and threats in cyber security.
- ❖ Students will have knowledge on External and Internal reconnaissance through various tools.
- ❖ Students will have better understanding upon how the system is compromised and user identity is compromised.
- ❖ Students will have an effective knowledge on web and mobile security
- ❖ Students will be aware on the ethics and policy guidelines that must be followed.
- ❖ Students will be given a fundamental knowledge on Cyber Forensics

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1								2	2	1	1
CO2	2	2	2	2	3								3	3	2
CO3	1	2	2	1			1					2	2	2	2
CO4	2	1	3				2					1	2	2	2
CO5	2	2	3	1		2	1	3		2				1	1
CO6	3	2	3	3	2	2	1	1				2	2	2	1

UNIT-1

Introduction to cyber crime- classification of cyber crime – Reasons for commission of cyber crime – Malware and its types – Kinds of cyber crime

Security Posture: The current threat landscape- Cyber security challenges- Enhancing your security posture- The Red and Blue Team

UNIT-2

Understanding the Cyber security Kill Chain: External reconnaissance - Internal reconnaissance - Access and privilege escalation – Sustainment – Assault –Obfuscation - Threat life cycle management.

UNIT-3

Compromising the System: Analyzing current trends –Phishing-Exploiting a vulnerability-Zero-day-Performing the steps to compromise a system

Chasing a User's Identity: Identity is the new perimeter- Strategies for compromising a user's identity -Hacking a user's identity

UNIT-4

Web & Mobile security: Introduction – Fundamental concepts and approaches-Appification- Webification- sandboxing- permission dialog based access control – Web PKI and HTTPS- Cookies – Password and Alternatives – Frequent software updates- Client side vulnerabilities and mitigation: Phishing & clickjacking – client side storage- physical attacks. Server side vulnerabilities and mitigation

UNIT-5

Security Policy: Reviewing your security policy -Educating the end user-Policy enforcement-Monitoring for compliance

Legal issues and Ethics: Protecting programs and data – Information and Law-Rights of Employees and Employers- Computer Crime- Ethical issues in computer security.

UNIT –6

Computer Forensics: What is Computer Forensics?, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Recourses/Employment Proceedings, Computer Forensics Services, Benefits of professional Forensics Methodology, Steps taken by Computer Forensics Specialists. Types of Computer Forensics Technology

TEXT BOOKS:

1. The Cyber Security Body of Knowledge, version 1.0 by Awais Rashid, The National Cyber Security Centre 2019.
2. Introduction to cyber crime, by Jeetendra Pande, Uttarakhand Open University, Haldwani
3. Security in computing by Charles p pflieger, Pearson Education; Fifth edition
4. Computer Forensics, Computer Crime Investigation by John R,Vacca, Firewall Media, New Delhi

REFERENCE BOOKS:

1. Information Security and Auditing in the Digital Age: A Practical Managerial Perspective Amjad Umar
2. Cybersecurity: Attack and Defense Strategies: Infrastructure security with Red by Erdal Ozkaya and Yuri Diogenes
3. Cyber Security Audit A Complete Guide - 2020 by Gerardus Blokdyk
4. Practical Malware Analysis: The Hands-On Guide to Dissecting Malicious Software By Michael Sikorski, Andrew Honig
5. Information Technology Control and Audit” by Angel R. Otero

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(A0540197) DESIGN PATTERNS
(Open Elective-II)

COURSE OBJECTIVES:

By the end of this course, you will:

- ❖ Have a deeper knowledge of the principles of object-oriented design
- ❖ Understand the design patterns that are common in software applications
- ❖ Understand how these patterns related to object-oriented design

COURSE OUTCOMES:

- ❖ Upon completion of course the students will be able to:
- ❖ Understand common design patterns in the context of iterative/incremental development
- ❖ Evaluate and Reuse software source code using patterns
- ❖ Analyze and combine the design patterns to work together in a software design
- ❖ Implement the design pattern in an object oriented language
- ❖ Understand the benefits of a pattern over a program in a software application

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3		3				3	3		2			
CO2	3	3	3		3	3		3	3	3		3			
CO3	3	3	3		2				1	3		2			
CO4	3	3	3		3				2	3		2			
CO5	2	3	3		3			2	2	3		3			

UNIT-I:

Review Of Formal Notations & Foundation Classes In C++ : Class diagram, Object diagram, Interaction diagram Examples. List, Iterator, List Iterator, Point, Rect.

UNIT-II

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

UNIT III

A Case Study: Designing a Document Editor: Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation

UNIT IV

Creational Patterns: Abstract Factory, Builder, Singleton, Discussion of Creational Patterns.

UNIT V

Structural Patterns: Adapter, Bridge, Composite, decorator.

UNIT VI

Behavioral Patterns: Observer, State, Strategy, Template Method, Discussion of Behavioral Patterns.

TEXT BOOKS:

1. Design Patterns By Erich Gamma, Pearson Education

REFERENCES:

1. Pattern's in JAVA Vol-I By Mark Grand, Wiley DreamTech.
2. Pattern's in JAVA Vol-II By Mark Grand, Wiley DreamTech.
3. JAVA Enterprise Design Patterns Vol-III By Mark Grand, Wiley DreamTech.
4. Head First Design Patterns By Eric Freeman-Oreilly-spd
5. Design Patterns Explained By Alan Shalloway, Pearson Education.
6. Pattern Oriented Software Architecture, F.Buschmann & others, John Wiley & Sons.

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(A0536197) ARTIFICIAL INTELLIGENCE

(Professional Elective-II)
(For Branches: ECE & CSE)

COURSE OBJECTIVES:

This course is designed to

- ❖ Learn different AI techniques and their implementation.
- ❖ Understand types of agents and the activities of agents.
- ❖ Learn problem solving using searching techniques, Problem characteristics and their implementations.
- ❖ Apply knowledge representation using pre-positional logic and First Order logic.
- ❖ Understand various learning algorithms

COURSE OUTCOMES:

- ❖ Understand and Learn Foundations of Artificial Intelligence.
- ❖ Learn Formulation of Problems as Search Problem and How to Solve Problems using Informed and Uninformed Techniques: Gradient Descent, Heuristic Search Strategies.
- ❖ Represent Knowledge using Logic. Interpret world using process of inference. Develop programs that extract Knowledge.
- ❖ Handle Uncertainty using Probability Notations.
- ❖ Learning Agents: Inductive Learning, Learning Decision Trees, Neural Network Learning.
- ❖ Applying Probabilistic Language Processing Interface for Machines.

MAPPING WITH COs&POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	2	1	1			1		2	1	1	1	2
CO2	2	3	3	2	2	1		1	1		2	1	1	1	2
CO3	3	3	3	2	2	2			1		2	2	1	2	2
CO4	2	3	1	2	2	3			1		1	2	1	2	2
CO5	2	2	3	1	2	1		1	1		1	2	1	2	2
CO6	2	3	2	3	2	1		1	2	2	2	2	1	2	2

* 3: Strong

2: Medium

1: Weak

0- NA

UNIT I: Introduction to AI:

What is AI, Foundations of AI, History of AI, The State of Art. **Intelligent Agents**: Agents and Environments, The Concept of Rationality, The Nature of Environments: PEAS, properties of Task Environment, The Structure of Agents: 4 Types of Agents

UNIT II: Solving Problems by Searching:

Problem Solving Agents, Example problems, Searching for Solutions, Uninformed Search Strategies, **Informed search strategies**, Heuristic Search Strategies, Heuristic Functions, **Local & Heuristic Search Algorithms** and Optimization Problems: Hill Climbing search, Simulated Annealing, Genetic Algorithms. Constraint Satisfaction Problems.

UNIT III: Knowledge Reasoning and Inference:

Knowledge based Agent, The Wumpus World Problem, **Logic**: Propositional Logic, First-Order Logic Knowledge and Reasoning: Inference in First-Order Logic: Propositional vs First Order inference. First-Order Logic: Syntax and Semantics of First order Logic, Using First Order Logic, Unification and Lifting, Forward Chaining. **Planning**: The planning problem formulation, The Language of Planning Problems, Examples: Air Cargo Transport, Spare Tyres

UNIT IV: Uncertainty Handling:

Acting under Uncertainty, Basic Probability Notation, Axioms of Probability, Inference using Full Joint Distribution, Bayes Rule and its Use, Probabilistic Reasoning Representing Knowledge in an Uncertain Domain, The semantics of Bayesian Networks.

UNIT V: Learning:

Forms of Learning, Inductive Learning, Learning Decision Trees, Ensembled Learning, Computational Learning. **Statistical Learning:** Instance Based Learning, Nearest neighbor Models, **Neural Networks:** Units in Neural Networks, Neural Network Structures, Single Layer Feed Forward Networks, Multilayer Feed Forward Neural Networks. Learning Neural Network structures.

UNIT VI: Language Processing and Present and Future of AI:

Probabilistic Language Processing: Phrase structure grammars, Syntactic Analysis, Augmented Grammars and semantic Interpretation, Information Retrieval, Information Extraction, Machine Translation. **Philosophical foundations:** Weak AI, Strong AI, Ethics and Risks of AI, **AI Present and Future:** Agent Components, Agent Architectures, Are we going in the right direction, What if AI does succeed.

TEXTBOOK:

1. Stuart J. Russell, Peter Norvig, "Artificial Intelligence A Modern Approach", 3rd Ed, Pearson Education/ Prentice Hall 2019.

REFERENCES:

1. Nilsson, Nils J., and Nils Johan Nilsson. Artificial intelligence: a new synthesis. Morgan Kaufmann, 1998.
2. Elaine Rich, Kevin Knight and Shivashankar B. Nair, Artificial Intelligence, 3/e, McGraw Hill Education, 2008.
3. Dan W. Patterson, Introduction to Artificial Intelligence and Expert Systems, PHI Learning, 2012.

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(A0541197) BIG DATA ANALYTICS
(Professional Elective-II)

COURSE OBJECTIVES:

- ❖ To understand Big Data Analytics for different systems like Hadoop.
- ❖ To learn the design of the Hadoop File System.
- ❖ To learn how to analyze Big Data using different tools.
- ❖ To understand the importance of Data in comparison with traditional data bases.

COURSE OUTCOMES: After completion of the course, students will be able to

- ❖ Understand the capability of No-SQL systems
- ❖ Outline the importance of Big Data Analytics
- ❖ To gain knowledge about working on the Hadoop File System.
- ❖ Ability to analyze Big Data using different tools.
- ❖ Apply Hadoop MapReduce programming for handling Big Data

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2		2	1				1	1			2		
CO2	1	2			1				1						
CO3	1	1	3	3	1				2		2	1		1	
CO4	3	3			3				2	1		1	1		1
CO5	2	2	2	3	2				2		2	1		2	

UNIT-1

Introduction to Big Data. What is Big Data? Why Big Data is Important. Meet Hadoop Data, Data Storage and Analysis, Comparison with other systems, Grid Computing. A brief history of Hadoop. Apache Hadoop and the Hadoop Ecosystem. Linux refresher, VMWare Installation of Hadoop.

UNIT-2

The design of HDFS. HDFS concepts. Command-line interface to HDFS. Hadoop File systems. Interfaces. Java Interface to Hadoop. Anatomy of a file read. Anatomy of a file writes. Replica placement and Coherency Model. Parallel copying with distcp, keeping an HDFS cluster balanced. Data integrity: Data Integrity in HDFS, Local Filesystem, Checksum Filesystem, Compression: Codecs, Compression and Input Splits

UNIT-3

Introduction. Analyzing data with Unix tools. Analyzing data with Hadoop. Java MapReduce classes(newAPI).Dataflow, combiner functions, Running a distributed Map Reduce Job. Configuration API. Setting up the development environment. Managing configuration. Writing a unit test with MRUnit. Running a job in local job runner. Running on a cluster, Launching a job. The MapReduce WebUI.

UNIT-4

Classic MapReduce. Job submission. Job Initialization. Task Assignment. Task execution Progress and status updates. Job Completion. Shuffle and sort on Map and reducer side. Configuration tuning. Map Reduce Types. Input formats. Output formats. Sorting. Map side and Reduce side joins.

UNIT-5

Pig Latin: structures, statements, expressions, types, schemas, functions, macros, User-defined functions, Data processing operators, pig in practice. The Hive Shell. Hive services. Hive clients. The meta store. Comparison with traditional databases. Hive QL. Hbasics. Concepts. Implementation. Java and Map-reduce clients. Loading data, and web queries.

UNIT-6

Big data technologies and Databases: Introduction to NoSQL, Uses, Features and Types,

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Need, Advantages, Disadvantages and Application of NoSQL, Overview of NewSQL, Comparing SQL, NoSQL and NewSQL, Introduction to MongoDB and its needs, Characteristics of MongoDB, Introduction of apache cassandra and its needs, Characteristics of Cassandra

TEXT BOOKS

1. Tom White, Hadoop: the definitive Guide", 4th Edition, O'Reilly Publications, 2015.
2. Subhashini Chellappan Seema Acharya , “Big Data and Analytics”, 2nd edition, Wiley Publishers, 2019

REFERENCES:

1. Dirkde Roos, Chris Eaton, George Lapis, Paul Zikopoulos, Tom Deutsch, "Understanding Big Data Analytics for Enterprise Class Hadoop and Streaming Data", Indian Edition ,TMH,2017.
2. R N Prasad , Seema Acharya, “Fundamentals of Business Analytics”, 2nd edition, Wiley Publishers, 2016

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IV B.Tech. I-Sem (CSE)

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(A0542197) FOG AND EDGE COMPUTING
(Professional Elective-II)

COURSE OBJECTIVES:

- ❖ Introduction to cloud computing and enabling technologies.
- ❖ Explore the need for fog and edge computation
- ❖ Impart the knowledge of application and issues in Fog and Edge computing

COURSE OUTCOMES:

- ❖ Understanding the Fundamentals of Fog and Edge computing
- ❖ Knowledge on the challenges faced in edge resources and optimizing the problem faced in fog and edge
- ❖ Analyzing the middleware in Fog and Edge computing
- ❖ Remembering the Technologies in Fog computing
- ❖ Evaluating the application and issues in Fog and Edge computing

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3			1								2	3	2	1
CO2	2	3	3	2	2							2	2	3	3
CO3	3			1								2	2	2	2
CO4	2			1	3							3	2	3	2
CO5	3	3	3	3	3	3	3					2	2	3	3
CO6	3			1								2	3	2	1

UNIT-1: Internet of Things (IoT) and New Computing Paradigms

Introduction-Relevant Technologies-Fog and Edge Computing Completing the Cloud-Hierarchy of Fog and Edge Computing-Business Models-Opportunities and Challenges

UNIT-2: Challenges in Federating Edge Resources

Introduction-Methodology-Integrated C2F2T Literature by Modeling Technique-Integrated C2F2T Literature by Use-Case Scenarios-Integrated C2F2T Literature by Metrics-Future Research Directions

UNIT-3: Optimization Problems in Fog and Edge Computing

Preliminaries-The Case for Optimization in Fog Computing-Formal Modeling Framework for Fog Computing-Metrics-Further Quality Attributes-Optimization Opportunities along the Fog Architecture-Optimization Opportunities along the Service Life Cycle-Toward a Taxonomy of Optimization Problems in Fog Computing

UNIT-4: Middleware for Fog and Edge Computing: Design Issues

Need for Fog and Edge Computing Middleware-Design Goals-State-of-the-Art Middleware Infrastructures-System Model-Proposed Architecture-Case Study Example

UNIT-5: Technologies in Fog Computing

Fog Data Management-Motivating Example: Smart Building-Predictive Analysis with Fog Torch-Machine Learning in Fog Computing-Data Analytics in the Fog-Data Analytics in the Fog Architecture-Configurations

UNIT-6: Applications and Issues

Exploiting Fog Computing in Health Monitoring-Smart Surveillance Video Stream Processing at the Edge for Real-Time Human Objects Tracking-Fog Computing Model for Evolving Smart Transportation Applications-Testing Perspectives of Fog-Based IoT Applications-Legal Aspects of Operating IoT Applications in the Fog

TEXT BOOKS

1. Buyya, Rajkumar, and Satish Narayana Srirama, eds, Fog and edge computing: principles and paradigms, 1st edition, John Wiley & Sons, 2019.

2. John Mutumba Bilay , Peter Gutsche, Mandy Krimmel and Volker Stiehl ,SAP Cloud Platform Integration: The Comprehensive Guide, 2nd edition, Rheinweg publishing, 2019

REFERENCE BOOKS

1. Bahga, Arshdeep, and Vijay Madiseti. Cloud computing: A hands-on approach, 1st edition, CreateSpace Independent Publishing Platform, 2013.
2. Ovidiu Vermesan, Peter Friess, Internet of Things –From Research and Innovation to Market Deployment, 1 st edition,River Publishers, 2014.

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IV B.Tech. I-Sem (CSE)

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(A0543197) LINUX SYSTEM ADMINISTRATION
(Professional Elective-III)

COURSE OBJECTIVES:

The Students will learn the following:

- ❖ To Understand and use essential tools, create simple shell scripts and Operate running systems
- ❖ To Configure local storage and File System
- ❖ To Deploy, configure, and maintain systems and manage basic networking
- ❖ To Manage users and groups
- ❖ To Manage security
- ❖ To Manage containers

COURSE OUTCOMES:

Upon the successful completion of the course, the student will be able:

- ❖ Students will learn about Access a shell prompt Create and edit text files Create, delete, copy, and move files and directories, Create hard and soft links.
- ❖ Students will be able to Boot, reboot, and shut down a system normally, Adjust process scheduling, Securely transfer files between systems.
- ❖ Students will be able to List, create, delete partitions on MBR and GPT disks, Create and remove physical volumes and logical volumes.
- ❖ Students will be able to Configure time service clients Install and update software packages from Red Hat Network, a remote repository, or from the local file system.
- ❖ Students will be able to Create, delete, and modify local user accounts, passwords, group membership, super user access.
- ❖ Students will be able to Create and use file access control lists, restore default file contexts, perform basic container management such as running, starting, stopping, and listing running containers.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1			1		2				1				1		
CO2		1	3		1								1	1	
CO3			1		1			1					1	1	
CO4		1	1		1	1							1	1	
CO5	2		2		1							1	1	2	1
CO6	1		2		1							1	1	2	

UNIT I:

Getting started with red hat enterprise linux: what is linux?, Describe and define open source, Linux distributions, and Red Hat Enterprise Linux. introduction to the bash shell, Log into a Linux system and run simple commands using the shell. Managing files from the command line: Linux file system, Copy, move, create, delete, and organize files while working from the bash shell, Hard Links and Soft Links.

UNIT II:

Get help in Red Hat Enterprise Linux: Resolve problems by using local help systems. Create, view, and edit text files. Manage local users and groups: Create, manage, and delete local users and groups, as well as administer local password policies Control access to files: Set Linux file system permissions on files and interpret the security effects of different permission settings. Monitor and manage Linux processes: Evaluate and control processes running on a Red Hat Enterprise Linux system.

UNIT III:

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Control services and daemons: Control and monitor network services and system daemons using systemd. Manage networking: Configure network interfaces and settings on Red Hat Enterprise Linux servers. Archive and transfer files: Archive and copy files from one system to another. Install and update software: Download, install, update, and manage software packages from Red Hat and yum package repositories.

UNIT IV:

Access Linux files systems: Access, inspect, and use existing file systems on storage attached to a Linux server, Run commands more efficiently by using advanced features of the bash shell, shell scripts, and various utilities provided by Red Hat Enterprise Linux. Schedule future tasks: Schedule commands to run in the future, either one time or on a repeating schedule.

UNIT V:

Tune system performance: Improve system performance by setting tuning parameters and adjusting scheduling priority of processes. Maintain basic storage: Create and manage storage devices, partitions, file systems, and swap spaces from the command line. Manage logical volumes: Create and manage logical volumes containing file systems and swap spaces from the command line.

UNIT VI:

Control the boot process: Manage the boot process to control services offered and to troubleshoot and repair problems. Manage network security: Control network connections to services using the system firewall and SELinux rules. Install Red Hat Enterprise Linux: Install Red Hat Enterprise Linux on servers and virtual machines.

TEXT BOOKS:

1. Red Hat Enterprise Linux 8.0 RH124 Red Hat System Administration I Edition 1
2. Red Hat Enterprise Linux 8.0 RH134 Red Hat System Administration II Edition 1

REFERENCES:

1. Red Hat Certified Engineer Study Guide Ansible Automation for the Red Hat Enterprise Linux 8 Exam.
2. Linux RHCSA Fast Track Study Guide EX200 Exam.
3. Red Hat RHCE 8 (EX294) Cert Guide (Certification Guide) 1st Edition.
4. The Linux System Administrator's Guide Version 0.9

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(A0544197) ADVANCED COMPUTER ARCHITECTURE
(Professional Elective-III)

COURSE OBJECTIVES:

- ❖ A broad understanding of computer architecture.
- ❖ To the extent possible, an understanding of the current state-of-the-art in uni-processor computer architecture.
- ❖ Study how to use technology to build the best computer/processor.
- ❖ To know different levels of parallelism.
- ❖ Issues in interconnection of networks and cluster design.

COURSE OUTCOMES:

Upon completion of this course, a student should have developed:

- ❖ Broad understanding of the design of computer systems, including modern architectures and alternatives.
- ❖ Understanding of the interaction amongst architecture, applications and technology.
- ❖ Understanding of a framework for evaluating design decisions in terms of application requirements and performance measurements.
- ❖ A historical perspective on computer system design.
- ❖ Develop applications for high performance computing systems.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		2	3		1					2					
CO2	1	1								2					
CO3		3	3								1				
CO4			1						2			1			
CO5		2	2		1					1		1			

UNIT -I

Fundamentals of computer design-Technology Trends, Cost, Measuring and reporting performance, Quantitative principles of computer design.

UNIT -II

Instruction set principle and examples-Classifying instruction set, Memory addressing, Addressing modes for signal processing, Operations in the instruction set, Instructions for control flow, encoding an instruction set, the role of the compiler.

UNIT -III

Instruction level parallelism-Over coming data hazards, Reducing branch costs, High performance instruction delivery, Hardware based speculation, Compiler techniques, Static branch prediction, H.W. vs S.W solutions, Limitations of ILP

UNIT -IV

Memory hierarchy design-Cache performance, Reducing cache miss penalty and miss rate, Virtual memory, Protection and examples of virtual memory.

UNIT -V

Multi processors and thread-level parallelism-symmetric shared memory architectures, Distributed -shared memory architectures, Synchronization, Multi-threading.

UNIT -VI

Storage systems Types of Storage Devices, RAID, Errors and failures in real time systems,
Interconnection Networks:- Interconnection network media, Practical issues for commercial interconnection of networks, Clusters, Designing a cluster.

TEXT BOOK:

1. Computer Architecture A quantitative approach 3rd edition John L. Hennessy & David A. Patterson Morgan Kaufmann (An Imprint of Elsevier)

REFERENCES:

1. "Computer Architecture and parallel Processing" Kai Hwang and A.Briggs International Edition McGraw-Hill.
2. Advanced Computer Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson.

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(A0545197) DISTRIBUTED SYSTEMS

(Professional Elective-III)

COURSE OBJECTIVES:

- ❖ Present the principles underlying the functioning of distributed systems;
- ❖ Create an awareness of the major technical challenges in distributed systems design and implementation;
- ❖ Expose students to modern and classic technology used in distributed systems and their software;
- ❖ Provide experience in the implementation of typical algorithms used in distributed systems

COURSE OUTCOMES:

After completing this course the student will be able to:

- ❖ Explain what a distributed system is, why you would design a system as a distributed system.
- ❖ List the desired properties of distributed systems.
- ❖ List the principles underlying the functioning of distributed systems
- ❖ Describe the problems and challenges associated with principles, and evaluate the effectiveness and shortcomings of their solutions.
- ❖ Recognise how the principles are applied in contemporary distributed systems and explain how they affect the software design, and be able to identify features and design decisions that may cause problems

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		2	2		3										
CO2					2				1	2					
CO3	1	3	1												
CO4			1					1	2		2	1			
CO5		1	1		2					2		1			

UNIT I

INTRODUCTION: What is Distributed System? Goals: Advantages of Distributed Systems over Centralized Systems, Advantages of Distributed Systems over Independent PCs, Disadvantages of Distributed Systems, Hardware Concepts, Design Issues: Transparency, Flexibility, Reliability, Performance, Scalability.

Communication in Distributed Systems I: Layered Protocols.

UNIT II

Communication in Distributed Systems II: The Client Server Model: Clients and servers, Addressing, Blocking Versus Nonblocking Primitives, Buffered versus Unbuffered Primitives, Reliable versus Unreliable Primitives, Implementing the Client-Server Model, Remote Procedure call, Group Communication.

UNIT III

Synchronization in Distributed Systems: Clock synchronization, Mutual Exclusion: A centralized Algorithm, A Distributed Algorithm, A Token Ring Algorithm, A comparison of three algorithms, Election Algorithms: The Bully Algorithm, A Ring Algorithm, Atomic Transactions, Deadlocks in Distributed systems.

UNIT IV

Processes and Processors in Distributed Systems: Threads, System Models, Processor Allocation, Scheduling in Distributed Systems, Fault Tolerance, Real-Time Distributed Systems: What is a Real-Time System? Design Issues, Real-Time Communication, Real-Time Scheduling.

UNIT V

Distributed File Systems and Shared Memory: Distributed File System Design: The File Service Interface, The Directory Service Interface, Semantics of File Sharing, Distributed File System Implementation: File Usage, System Structure, Caching, Replication, What is Shared Memory? Page-Based Distributed Shared Memory.

UNIT VI

CASE STUDY 1 AMOEBA: Introduction to AMOEBA, Objects and Capabilities, Process Management, Memory Management, Communication.

CASE STUDY 2 MACH: Introduction to MACH, Process management, Memory Management, Communication.

TEXT BOOKS:

1. Distributed Operating Systems, A.S.Tanenbaum, Pearson Education.

REFERENCES:

1. Distributed Systems Concepts and Design, G Coulouris, J Dollimore and T Kindberg, Fourth Edition, Pearson Education
2. Distributed Operating Systems Concepts and Design, Pradeep K.Sinha, PHI.
3. Advanced Concepts in Operating Systems, M Singhal, N G Shivarathri, Tata McGraw-Hill Edition.
4. Reliable Distributed Systems, K.P.Birman, Springer.
5. Distributed Operating Systems and Algorithm Analysis,R.Chow, T.Johnson,Pearson.

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(A0546197) ADVANCED DATABASES
(Professional Elective-IV)

COURSE OBJECTIVES:

The first is study of the classical distributed database management

- ❖ Issues in Distribution design, distributed query processing, and distributed transaction management.
- ❖ To learn about Optimization in DDB
- ❖ Architectural Issues in DDB

COURSE OUTCOMES:

Upon completion of the course students are able to

- ❖ Understand distributed database management concepts.
- ❖ Get good knowledge of distribution transparency and they will know the architecture of distributed databases.
- ❖ Understand complex topics like Distribution design, distributed query processing.
- ❖ Find solutions to the some of the Architectural issues.
- ❖ Solve the problems of deadlocks and concurrency control.
- ❖ Give new examples of distributed database design.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3			1	1				1	1		1			
CO2	2			1	1		1			1		1			
CO3	2	1		1	1		1		1	1		1			
CO4	2	1		1	1		1		1	1		1			
CO5	1	1		1	1										
CO6	1	1		1	1		1		1	1					

UNIT I

Introduction to Distributed Databases: Features of Distributed versus Centralized Databases, why distributed databases?, Distributed Database Management Systems, Review of databases, Review of computer networks.

UNIT II

Levels of Distribution Transparency: Reference Architecture for Distributed Databases, Types of Data Fragmentation, Distribution transparency for read only applications, Distribution transparency for update applications, distributed database access primitives, Integrity Constraints in Distributed Databases.

UNIT III

Distributed Database Design: A Framework for Distributed database Design, The Design of database Fragmentation

UNIT IV

Translation of Global Queries to Fragment Queries: Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and aggregate Function Evaluation, Parametric Queries.

UNIT V

The Management of Distributed Transactions: A Framework for Transaction Management Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.

UNIT VI

Concurrency Control: Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

TEXT BOOKS:

1. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti
McGraw-Hill

REFERENCES:

1. Principles of Distributed Database Systems, M.Tamer Ozsu, Patrick Valduriez –
Pearson Education.

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(A0547197) R – PROGRAMMING
(Professional Elective-IV)

COURSE OBJECTIVES:

- ❖ Understand the fundamentals of 'R' programming
- ❖ Learn how to carry out a range of commonly used statistical methods including analysis of variance and linear regression.
- ❖ Explore data-sets to create testable hypotheses and identify appropriate statistical tests.

COURSE OUTCOMES: After completing the course, students will able to

- ❖ Describe purpose of R language and working with its tool.
- ❖ Describe R objects, their data operations and descriptive statistical functions.
- ❖ Apply data distribution and hypothesis testing.
- ❖ Applying data using graphs and complex statistics like anova.
- ❖ Apply summarizing data and regression modeling.
- ❖ Learn to export graphs and writing the scripts.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3										2	2			1
CO2			2											2	
CO3					3						1			1	
CO4		3		1											2
CO5								2	1				2		
CO6			3		2						2			1	

UNIT-I

INTRODUCING R: Getting the Hand of R, Running the R Program, Finding Your Way with R, Command Packages.

BECOMING FAMILIAR WITH R: Reading and Getting Data into R, Viewing Named Objects, Types of Data Items, The Structure of Data Items, Examining Data Structure, Working with History Commands, Saving your Work in R.

UNIT-II

WORKING WITH OBJECTS: Manipulating Objects, Viewing Objects within Objects, Constructing Data Objects, Forms of Data Objects: Testing and Converting.

Data: Descriptive statistics and tabulation: Summary Commands, Summerizing Samples, Summary Tables.

UNIT-III

Data: DISTRIBUTION: Looking at the Distribution of Data

SIMPLE HYPOTHESIS TESTING: Using the Student's t-test, The Wilcoxon U-Test (Mann-Whitney), Paired t- and U-Tests, Correlation and Covariance, Tests for Association.

UNIT-IV

INTRODUCTION TO GRAPHICAL ANALYSIS: Box-whisker Plots, Scatter Plots, Pairs Plots(Multiple Correlation Plots) Line Charts, Pie Charts, Cleveland Dot Charts, Bar Charts, Copy Graphics to Other Applications.

FORMULA NOTATION AND COMPLEX STATISTICS: Examples of Using Formula Syntax for Basic tests, Formula Notation in Graphics, Analysis of Variance (ANOVA).

UNIT-V

MANIPULATING DATA AND EXTRACTING COMPONENTS: Creating Data for Complex Analysis, Summarizing Data.

REGRESSION (LINEAR MODELING): Simple Linear Regression, Multiple Regression, Curvilinear Regression, Plotting Linear Models and Curve Fitting, Summarizing Regression Models.

UNIT-VI

MORE ABOUT GRAPHS: Adding elements to existing plots, Matrix plots, multiple plots in one window, exporting graphs.

WRITING YOUR OWN SCRIPTS:

BEGINNING TO PROGRAM: Copy and Paste Scripts, Creating Simple Functions, Making Source Code.

TEXT BOOKS:

1. “Beginning R the statistical programming language” Dr.Mark Gardener, Wiley Publications, 2015.

REFERENCES BOOKS:

1. Hands-On Programming with R Paperback by Grolemond (Author), Garrett (Author), SPD, 2014.
2. The R Book, Michael J. Crawley, WILEY, 2012.

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(A0555197) BUSINESS INTELLIGENCE
(Professional Elective-IV)

COURSE OBJECTIVES:

To give students

- ❖ Understand the role of BI in enterprise performance management and decision support.
- ❖ Understand the applications of data mining and intelligent systems in managerial work.
- ❖ Understand data warehousing and online analytical processing (OLAP) concepts,
- ❖ Including dimensional modelling, star and snowflake schemas, attribute hierarchies, Metrics, and cubes.
- ❖ Learn data analysis and reporting using available BI software.

COURSE OUTCOMES:

Students will be able to

- ❖ Appraise and apply evidence practice (EBP) to formulate effective solutions to deal with contemporary performance problems and issues associated with the delivery of business information systems.
- ❖ Create a consultant report that critically evaluates important design principles and operations involving business intelligence and that offers effective recommendations aimed at enhancing business outcomes.
- ❖ Demonstrate competence in oral, written, and visual communication in business reports and presentations.
- ❖ Develop small size reports in BI
- ❖ Focus on how Data Ware house and Data mining are used in BI.
- ❖ Get an exposure on BI software tools.

MAPPING WITH COs&POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3														
CO2			3	2											
CO3				3						3		2			
CO4				2	3										
CO5					2										
CO6					3							2			

UNIT-I

Introduction to Business intelligence: Definition and History of BI, Transaction processing versus analytical processing, BI Implementation, Major tools and techniques of BI

UNIT-II

Data warehousing: Definition and concepts, Data warehouse architecture, ETL process, data warehouse development, Top down vs. Bottom up, Data Mart vs. EDW, Implementation issues, Real-time data warehousing

UNIT-III

Business performance management: Key performance indicators and operational metrics, balanced scorecard, Six Sigma, Dashboards and scorecards.

UNIT-IV

Data Mining for Business Intelligence: Data mining process, Data mining methods, ANN for Data Mining

UNIT-V

Text and Web mining for Business intelligence: Text mining Applications, Process and Tools, Web content, structure and usage mining

UNIT-VI

BI implementation, Integration and emerging trends: Implementing BI, BI Application Life Cycle, Connecting BI to Enterprise systems, on- demand BI, Issues of legality, privacy and Ethics, Emerging topics in BI, Social Networking and BI, RFID and BI

TEXT BOOKS:

1. Business Intelligence: A Managerial Approach, 2nd Edition, PEARSON 2012
Authors: EfraimTurban, Ramesh Sharda, Dursun Delen, and David King ISBN-10: 0-13-610066-X ISBN-13: 978-0-13-610066-9
2. Oracle Business Intelligence Applications, McGraw Hill Education 2013 Authors :
Simon Miller, William Hutchinson ISBN-10: 93-5134-153-4 ISBN-13: 978-93-5134-153-6

REFERENCE BOOKS:

1. Fundamentals of Business Analytics R.N Prasad, seema acharya, wiley (2011)
2. Getting Started with Business Analytics: Insightful Decision Making: David R Hardoon, galith shmueli, Chapman and Hall/CRC(2013)

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(A0548197) BLOCK CHAIN TECHNOLOGY

(Skill Development Course)

COURSE OBJECTIVES:

- ❖ Understand fundamentals of Blockchain Technology.
- ❖ To learn the concept of mining and forking.
- ❖ To be familiar with Blockchain security.
- ❖ To be familiar with Consensus Algorithm
- ❖ To learn about Dapps.
- ❖ Design, build, and deploy smart contracts and distributed applications.

COURSE OUTCOMES:

At the end of this course students will be able to...

- ❖ Explore the working of Blockchain technology.
- ❖ Describe the Mining and Forking.
- ❖ Illustrate the concepts of Blockchain security.
- ❖ Understand and explain consensus Algorithms
- ❖ Apply the learning of solidity and de-centralized apps on Ethereum (Apply)
- ❖ Understand and analyse the working of Hyperledger (Analyze).

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1				1	1			1	1		1	2	1	1
CO2	1		3		1	1			2		1		2	2	1
CO3	1		2		1					1		2	1	2	1
CO4	1	2							1	2		2	2	2	3
CO5		3	3	2	2						2	1	2	3	2
CO6		3		2	2				2		1	1	2	3	2

UNIT-I**INTRODUCTION TO BLOCKCHAIN**

Introduction to Blockchain: Blockchain, Digital Ledger Technology (DLT), Peer-to-Peer (P2P) Network, Centralized, Decentralized and Distributed Networks, Types of Blockchain- Public Blockchain, Private Blockchain, How blockchain dependent cryptocurrencies work, History of Bitcoin , Bitcoin Cryptocurrencies- Double-Spending, Double Spending problem and its avoidance in Blockchain.

UNIT- II**BLOCKCHAIN MINING AND FORKING**

Permission, Permission less, Forking – Soft forking, Hard Forking, Cryptographic changes in forking, Merkle Tree, Bitcoin Mining, Mining Incentives Strategies.

UNIT-III**BLOCKCHAIN SECURITY**

Cryptographic Hash Functions – Cryptographic Nonce, Transactions, Asymmetric Key Cryptography, Address and Address Derivation – Private Key Storage, Ledgers, Blocks, Chaining Blocks, Zero Knowledge System, Attacks – 51% attack, Sybill attack.

UNIT-IV**CONSENSUS ALGORITHM**

Proof of Work Consensus Algorithm, Proof of Stake Consensus Algorithm, Round Robin Consensus Algorithm, Proof of Authority/Proof of Identity Consensus Algorithm, Proof of Elapsed Time Consensus Algorithm.

UNIT-V

DECENTRALIZED APPLICATIONS (DAPPS)

Decentralized Application Types – Ethereum Platform – Transactions in Ethereum – Ether wallet, Ether Accounts, Ether Gas, Gas Price, Gas Limit, Ether Tokens – ERC20 ethereum stands for Tokens, Mining in Ethereum and Awards.

UNIT-VI HYPERLEDGER

Hyperledger fabric components, Hyperledger Fabric Architecture, Hyperledger Fabric and Smart Contract – Solidity Language ,Chain Code design and Go Language.

REFERENCES

1. Arvind Narayanan, “Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction”, Princeton University Press, July 19, 2016.
2. Don and Alex Tapscott, “Blockchain Revolution”. Portfolio Penguin 2016.
3. William Mougayar, “Business Blockchain Promise, Practice and Application of the Next Internet Technology, John Wiley & Sons 2016.
4. Draft version of “S. Shukla, M. Dhawan, S. Sharma, S. Venkatesan, ‘Blockchain Technology: Cryptocurrency and Applications’, Oxford University Press, 2019.
5. Josh Thompson, ‘Blockchain: The Blockchain for Beginnings, Guild to Blockchain Technology

(A0587197) SOFTWARE TESTING TOOLS LAB**COURSE OBJECTIVES:**

Upon successful completion of this course students will be able to:

- ❖ Understand the basic concepts of software testing.
- ❖ Understand the various techniques and strategies of software testing and inspection and pointing out the importance of testing in achieving high-quality software.
- ❖ Perform effective and efficient structural testing of software.
- ❖ Integrate and test the various units and components of a software system.
- ❖ Perform effective and efficient functional testing of software.
- ❖ Select the appropriate tests to regression test your software after changes have been made.
- ❖ Plan, track and control the software testing effort.
- ❖ Understand the need of automated testing tools and various kinds of automated testing tools.

COURSE OUTCOMES:

- ❖ To understand the control structure of C program, Test cases, Test criteria, Test strategies and Testing Tools.
- ❖ To analyze the comparative study of Various Testing Techniques, and Tools.
- ❖ To design and conduct Manual Test Cases for a software testing project.
- ❖ To apply software testing tool to support test automation.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1		1		1	2			2	2			
CO2	3	3	3		2		2	2		1	3	1			
CO3	3	1	3	3			1	3	3	3	3				
CO4	3		3	3	3		1	3	3	3	3				

Lab Experiments:

1. Write programs in 'C' Language to demonstrate the working of the following constructs:
 - i) do...while ii) while loop iii) if...else iv) switch v) for loop
2. "A program written in 'C' language for Matrix Multiplication fails" Introspect the causes for its failure and write down the possible reasons for its failure.
3. Write manual test cases for Gmail application.
4. Write manual test cases for ATM application.
5. Write manual test cases for banking application.
6. Study of Quick Test Professional(QTP):
7. Overview of QTP Components.
8. Record & Run Options.
9. Generating Basic Script.
10. Enhancement of Script.
11. Check Points.
12. Output Values.
13. Object Repository.
14. Writing Script manually.
15. Study of Rational Functional Tester (RFT).
16. Study of SELENIUM.

REFERENCES:

Software testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.

(A0588197) LINUX SYSTEM ADMINISTRATION LAB

COURSE OBJECTIVES:

- ❖ Log in to a Linux system on a local text console and run simple commands using the shell and describe the purpose of users and groups on a Linux system.
- ❖ Control system daemons and network services and Maintain accurate time synchronization using NTP and configure the time zone.
- ❖ Describe fundamental concepts of network addressing and routing for a server and Manage network settings and devices using nmcli.
- ❖ Register a system to your Red Hat account and assign it entitlements for software updates and support services using Red Hat Subscription Management, Find, install, and update software packages using the yum command
- ❖ Find text matching a pattern in log files and command output using the grep command and regular expressions. Schedule commands to run on a repeating schedule using a user's crontab file.
- ❖ Describe use cases for ACLs, identify files that have ACLs set, and interpret the effect of those ACLs and Create storage partitions, format them with file systems, and mount them for use. Create and manage swap spaces to supplement physical memory

COURSE OUTCOMES:

- ❖ Understand and use essential tools and Create simple shell scripts.
- ❖ Configure local storage and Create and configure file systems.
- ❖ Manage basic networking and Manage users and groups.
- ❖ Create and configure file systems.
- ❖ Manage security by Configure firewall settings using firewall-cmd/firewalld
- ❖ Find and retrieve container images from a remote registry and Build a container from a Container file

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		2	1							3			1	2	
CO2	1							3			2		1	2	
CO3		1							2		1		2		3
CO4				1			2							1	1
CO5	2		1		3										1
CO6						1				2				2	2

1. Install Red Hat Enterprise Linux on servers and virtual machines.
2. a) Find all files with the name "passwd" and copy them in to the directory /mnt/copy
b) locate the files of owner "root" and copy to the location /root/found directory.
3. a) The user owner should have all permissions to the directory "Dir"
b) Create a compressed archive of /etc directory and name it as /root/com.gz
c) copy the lines containing the word "root" in /etc/passwd and copy them in to file /mnt/pass
4. Describe the procedure to configure a repository and install packages.
5. Explain the uses of the following commands
a) Tuned b) NTP c) systemctl
6. Create a group newgroup
a) create a user "harsh" and make newgroup as the secondary group.
b) create a user "ravi", do not add to new group as the secondary group. "ravi" should not have a login shell
c) Assign all the above users password as "redhat"
7. Copy the file /etc/fstab to /var/fstab

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- a) the user owner of /var/fstab should be root.
 - b) the user natasha should have read and write access.
 - c) the group mac should have no access.
8. Create a directory /linux
- a) Make the group owner “mac” and
 - b) Ensure all files in /linux , the group owner is mac.
 - c) Ensure all future files within /linux the group owner is mac.
9. a) Create a partition “par1” of size 1Gb
- b) add a swap partition of size 750Mb. Do not delete the existing Swap.
10. a) Create a Logical Volume LV1 of size 8Gb.
- b) Extent the Logical Volume LV1 by 2Gb.
11. Create a VDO named V1 of size50 Gband mount it at /v1.
12. a) Execute a Command /usr/local/bin/backup at exactly 10.00 am on Feb 4th every year.
- b) Configure a CRON job that runs for the user “anil” at 12:08 every Thursday and execute /bash/echo Hello
13. a) List the lines containing the word root in /etc/groups file
- b) find the word “root” in /etc/passwd and copy it into the file /tmp/pass.
14. a) Reset root password to 12345.
- b) Create a user named “Test” and set password to 12345.
15. Configure the Network Connection using nmcli (Creating new Connection or Modify Existing Connection).
16. Explain the procedure for
- a) Pulling a container Image.
 - b) Running a container.
 - c) Map the Container to directory
 - d) Run the Container as a service.

REFERENCES:

1. Red Hat Enterprise Linux 8.0 RH124 Red Hat System Administration I Edition 1
2. Red Hat Enterprise Linux 8.0 RH134 Red Hat System Administration II Edition 1
3. “UNIX - Concepts and Applications”, Sumitabha Das 4th Edition, Tata McGraw Hill, 2006.

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IV B.Tech. II-Sem (CSE)

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(A0550198) SOFTWARE APPLICATION DEVELOPMENT USING DEVOPS
(Professional Elective-V)

COURSE OBJECTIVES:

The course is designed to

- ❖ Explain the DevOps Concepts for business cases
- ❖ Prepare the model canvas for DevOps use cases
- ❖ Introduce the virtual machines and containers for designing of applications
- ❖ Familiar with cloud provisioning and management services
- ❖ Testing the code with various aspects in continuous deployment / development

COURSE OUTCOMES:

After completion of the course, students will be able to

- ❖ Understands the DevOps concepts in continuous delivery / development of applications
- ❖ Create the DevOps applications using various tools and technologies
- ❖ Examine the virtual machines and containers for managing the files
- ❖ Apply cloud services for deployment the applications in a real-time
- ❖ Analyze the web security and code testing with appropriate tools

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1	1	3						2	1	1	1	2
CO2	1	1	1	1	3						1	1	1	1	2
CO3	1	1	3	1	2						2	1	1	1	1
CO4	2	2	2	1	2						1	1	1	1	2
CO5	2	1	1	1	3						1	1	2	1	2

UNIT-I**DevOps Concepts:**

Understanding DevOps movement, DevOps with changing time, The water fall model, Agile Model, Collaboration, Why DevOps, Benefits of DevOps, DevOps life cycle- all about continuous, Build Automation, Continuous Integration, Continuous Management, Continuous Delivery / Continuous Development, The agile wheel of wheels

UNIT-II**DevOps Tools and Technologies:**

Code Repositories : Git, Differences between SVN and Git, Build tools – Maven, Continuous integration tools – Jenkins, Container Technology – Docker, Monitoring Tools – Zenoss, Continuous integration with Jenkins 2, Creating built-in delivery pipelines, Creating Scripts, Creating a pipeline for compiling and executing test units, Using the Build Pipeline plugin, Integrating the deployment operation, Getting started with Chef, Overview of hosted Chef, Installing and configuring a Chef workstation. Converging a Chef node using a Chef workstation, Installing software packages using cookbooks, Creating a Role

UNIT-III**Docker Containers:**

Overview of Docker containers, Understanding the difference between virtual machines and containers, Installation and configuration of Docker on CentOS, Creating your first Docker container, Managing containers, Creating a Docker image from Docker file, An overview of Docker's elements, Creating a Dockerfile, Writing a Dockerfile, Building and running a container on a local machine, Testing a container locally, Pushing an image to Docker Hub

UNIT-IV**Cloud Provisioning and Configuration Management with Chef:**

Chef and cloud provisioning, Installing knife plugins for Amazon EC2 and Microsoft Azure, Creating and configuring a virtual machine in Amazon Web Services, Creating and configuring a virtual machine in Microsoft Azure, Managing Docker containers with Chef, Prerequisite – deploying our application on a remote server, Deploying the application on AWS, Deploying the application on Microsoft Azure, Deploying the application in a Docker container.

UNIT-V**Managing Containers Effectively with Kubernetes**

Kubernetes architecture overview, Installing Kubernetes on a local machine, Installing the Kubernetes dashboard, Kubernetes application deployment, Using AKS, Creating an AKS service, Configuring kubectl for AKS, The build and push of the image in the Docker Hub, Advantages of AKS, Creating a CI/CD pipeline for Kubernetes with Azure Pipelines

UNIT-VI**Testing the Code**

Manual testing, Unit testing, JUnit in general and JUnit in particular, A JUnit example, Automated integration testing, Docker in automated testing, Performance testing, Automated acceptance testing, Automated GUI testing, Integrating Selenium tests in Jenkins, JavaScript testing, Testing backend integration points, Test-driven development, A complete test automation scenario, Manually testing our web application, Security and Performance Tests: Applying web security and penetration testing with ZAP, Running performance tests with Postman

TEXTBOOKS:

1. Mitesh Soni, DevOps for Web Development, Packt Publishing, 2016
2. Mikael Krief , Learning DevOps- The complete guide to accelerate collaboration with Jenkins, Kubernetes, Terraform and Azure DevOps, Packt Publishing, 2019

REFERENCE BOOKS:

1. Joakim Verona , Practical DevOps, Packt Publishing, 2016
2. Michael Huttermann, DevOps for Developers, Apress publishers,2012.
3. Sanjeev Sharma, The DevOps Adoption Playbook, Published by John Wiley & Sons, Inc.2017.
4. Sanjeev Sharma & Bernie Coyne, DevOps for Dummies, Published by John Wiley & Sons, Inc

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(A0551198) ETHICAL HACKING
(Professional Elective-V)

COURSE OBJECTIVES:

- ❖ The aim of the course is to introduce the methodologies and framework of ethicalhacking for enhancing the security.

COURSE OUTCOMES:

- ❖ To Understand the Impacts of Hacking and vulnerability analysis;
- ❖ To gain an understanding on the Security models and Information Security Program
- ❖ Develop an idea about Business Perspective and Planning a Controlled Attack.
- ❖ Gain knowledge about how to prepare for hacking.
- ❖ Understand about Enumeration and Exploitation
- ❖ Understand about document preparation and presentation integration.

MAPPING WITH COs & POs:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PS01	PS02	PS03
CO1		1	1		1			2	1			1		1	1	1
CO2	2	2	1	1	1							1		1	1	1
CO3		2	1	1				1	1					1		2
CO4		1		1										1	1	2
CO5	1	1							1						1	1
CO6	1	1		1										1	1	1

UNIT- I

Introduction: Hacking Impacts, The Hacker Framework: Planning the test, Sound Operations, Reconnaissance, Enumeration, Vulnerability Analysis, Exploitation, Final Analysis, Deliverable, Integration Information.

UNIT- II

Security Models: Computer Security, Network Security, Service Security, Application Security, Security Architecture Information Security Program: The Process of Information Security, Component Parts of Information Security Program, Risk Analysis and Ethical Hacking

UNIT - III

The Business Perspective: Business Objectives, Security Policy, Previous Test Results, Business Challenges Planning for a Controlled Attack: Inherent Limitations, Imposed Limitations, Timing is Everything, Attack Type, Source Point, Required Knowledge, Multi-Phased Attacks, Teaming and Attack Structure, Engagement Planner, The Right Security Consultant, The Tester, Logistics, Intermediates, Law Enforcement

UNIT – IV

Preparing for a Hack: Technical Preparation, Managing the Engagement Reconnaissance: Social Engineering, Physical Security, Internet Reconnaissance

UNIT - V

Enumeration: Enumeration Techniques, Soft Objective, Looking Around or Attack, Elements of Enumeration, Preparing for the Next Phase **Exploitation:** Intuitive Testing, Evasion, Threads and Groups, Operating Systems, Password Crackers, RootKits, applications, Wardialing, Network, Services and Areas of Concern

UNIT – VI

Deliverable: The Deliverable, The Document, Overall Structure, Aligning Findings, Presentation Integration: Integrating the Results, Integration Summary, Mitigation, Defense Planning, Incident Management, Security Policy, Conclusion

TEXTBOOK:

1. James S. Tiller, "The Ethical Hack: A Framework for Business Value Penetration Testing", Auerbach Publications, CRC Press

REFERENCE BOOKS:

1. EC-Council, "Ethical Hacking and Countermeasures Attack Phases", Cengage Learning
2. Michael Simpson, Kent Backman, James Corley, "Hands-On Ethical Hacking and Network Defense", Cengage Learning.

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2 1 3**(A0552198) MULTIMEDIA AND APPLICATION DEVELOPMENT**

(Professional Elective-V)

COURSE OBJECTIVES:

- ❖ The skills have to be acquired across a range of careers in multimedia including games development, web application development, multimedia application development, computer based training, e-Learning application development, interactive multimedia development, software development, software analysis, project management.

COURSE OUTCOMES:

The student will be able to:

- ❖ Understand the fundamental concepts of multimedia.
- ❖ Identify the basic multimedia content types.
- ❖ Write the basic programs in Action Script 2.0
- ❖ Explain data compression algorithms.
- ❖ Learn action script programming skills.
- ❖ Understand different concepts in Digitization.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2							1				1			
CO2	2	1				1									
CO3			1			1									
CO4				1		1									
CO5	2			1											
CO6	2											1			

UNIT-I: FUNDAMENTAL CONCEPTS IN TEXT AND IMAGE

Multimedia and hypermedia, World Wide Web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color Models in images.

UNIT-II: FUNDAMENTAL CONCEPTS IN VIDEO AND DIGITAL AUDIO

Types of video signals, analog video, digitization of sound, quantization and transmission of audio.

UNIT-III: ACTION SCRIPT I

Action Script Features, Object-Oriented Action Script, Data types and Type Checking, Action Script Classes: Defining classes, Constructor functions, Properties, Methods, Constructors, Completing Box Class.

UNIT-IV: ACTION SCRIPT II

Inheritance, Interfaces, Packages, Exceptions.

UNIT-V: APPLICATION DEVELOPMENT

An OOP Application Frame work, Using Components with Action Script 2.0.

UNIT-VI: FUNDAMENTALS OF MULTIMEDIA DATA COMPRESSION

Lossless compression algorithm: Introduction, Basics of Information Theory, Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression

Lossy compression algorithm: Introduction, Distortion Measures, The rate distortion Theory, Quantization.

TEXT BOOKS:

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1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. First Edition, Drew PHI/Pearson Education, 2003.
2. Essentials Action Script 2.0, Colin Moock, 2nd Edition, SPD O, REILLY, 2004.

REFERENCE BOOKS:

1. Digital Multimedia, Nigel chapman and jenny chapman, Wiley-Dreamtech. Macromedia Flash MX Professional 2004 Unleashed, Pearson.
2. Multimedia and communications Technology, Steve Heath, Elsevier (Focal Press).
3. Multimedia Applications, Steinmetz, Nahrstedt, Springer.
4. Multimedia Basics by Weixel Thomson
5. Multimedia Technology and Applications, David Hilman, Galgotia

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(A0026198) MANAGEMENT SCIENCE
(Open Elective-III)

COURSE OBJECTIVES:

- ❖ To know the concept of management administration and organization structure.
- ❖ To know the personnel management and human resource management concept.
- ❖ To understand present effective production techniques.
- ❖ To know the marketing concept and functions.
- ❖ To know the rules for network diagram, PERT and CPM, project crashing.
- ❖ To know the concept of women entrepreneurship.

COURSE OUTCOMES:

- ❖ Students are able to know importance of management in different areas.
- ❖ Students are able to know what type of structures is using the present organization.
- ❖ Students are able to know how to design the plant layout and plant location.
- ❖ Students are able to know the importance of human resource department in organization.
- ❖ Students are able to know how to complete the project within the time by crashing the activities.
- ❖ Students are able to understand the importance of women playing a vital role in entrepreneurship.

MAPPING WITH COs&POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3											1			
CO2	1		3											1	
CO3	1		3		2										
CO4	1								3	1			1		
CO5											3	1		1	
CO6							3	1				1			

UNIT-I

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

UNIT-II

DESIGNING ORGANIZATIONAL STRUCTURES: Basic concepts related to Organisation - Departmentation and Decentralisation, Types of mechanistic and organic structures of organisation (Line organization, Line and staff organization, functional organization, Committee organization, matrix organization, Virtual Organisation, Cellular Organisation, team structure, boundaryless organization, inverted pyramid structure, lean and flat organization structure) and their merits, demerits and suitability.

UNIT-III

OPERATIONS MANAGEMENT: Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), materials management: Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records-supply chain management, Marketing: functions of marketing, marketing mix, marketing strategies based on product life cycle, channels of distribution.

UNIT-IV

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

UNIT-V

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

UNIT-VI

WOMEN ENTREPRENEURSHIP: Scope of Entrepreneurship among women- promotional efforts in supporting women entrepreneurs in India-opportunities for women entrepreneurs –challenges or problems of women entrepreneurs-successful cases of women entrepreneurs.

TEXT BOOKS:

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

REFERENCES:

1. Kotler Philip & Keller Kevin Lane: Marketing Mangement 12/e, PHI, 2005.
2. Koontz & Weihrich: Essentials of Management, 6/e, TMH, 2005.
3. Thomas N. Duening & John M. Ivancevich Management-Principles and Guidelines, Biztantra, 2003.
4. Kanishka Bedi, Production and Operations Management, Oxford University Press, 2004.
5. Memoria & S.V. Gauker, Personnel Management, Himalaya, 25/e, 2005

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(A0553198) ORGANIZATIONAL BEHAVIOUR
(Open Elective-III)

COURSE OBJECTIVES:

- ❖ To provide students with the conceptual framework and theories of Organisational Behaviour.
- ❖ To understand individual behaviour in organizations including attitudes, personality, values, perception.
- ❖ To enable students to describe how people behave under different conditions and understand why people behave as they do.
- ❖ To identify the various leadership styles and the role of leaders in a decision making process
- ❖ To explain group dynamics and demonstrate skills required for working in groups (team building)
- ❖ To discuss about implementation of organizational culture, change and Conflict management.

COURSE OUTCOMES:

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

- ❖ Apply the conceptual foundation and theories of organizational behaviour.
- ❖ To develop a good working environment for an individual for the smooth running of the organization.
- ❖ To analyse inefficiency and weakness in individual and apply various measures to motivate the employees in the organization.
- ❖ The students can learn how to delegate authority and use power to influence people to get the work done
- ❖ To analyse how to develop coordination and teamwork in the organisation.
- ❖ To apply how to use organization culture and change in an effective manner

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2		3	3	2			2	3	3	3	3	2	
CO2	3	3	3	2	2	2	1				2	2	3	3	3
CO3	1	2	3		2		1			2			1	2	3
CO4	2	3		2	3				1			3	2	3	
CO5	3	3		2	3		1		2	2	2	2	3	3	
CO6	1				1		2			3	1	1	3	1	1

UNIT I**Introduction**

Conceptual Foundation of Organizational Behavior - Nature and Characteristics – Determinants - Contributing Disciplines - Challenges and Opportunities - Models and Approaches of Organizational Behavior- OB and Emotional Intelligence.

UNIT II**Perception, Personality, Attitude, and Values:**

Nature, Process & Importance - Factors Influencing Perception - Concept and Determinates - Types and Traits -Major Personality Attributes Influencing Organizational Behavior - Locus of Control - Concept of Pygmalion Effect; an overview of Emotions and feelings – Values - Beliefs and Attitudes with Managerial Implications.

UNIT III**Motivation:**

Concept – Importance of Motivation - Major Theories and Process of Motivation: Maslow's Need-Hierarchy Theory - Herzberg's Motivation-Hygiene Theory - McGregor's

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Theory X and Theory Y - Cognitive Evaluation Theory - Goal-Setting Theory - Reinforcement Theory - ERG Theory - Vroom's Expectancy Theory - Linking Employee Involvement Programmes and Motivation Theories.

UNIT: IV

Leadership:

Concept and Functions - Style and Theories of Leadership – Traits -Behavioral and Situational/Contingency Groups of Theories - Charismatic Leadership - Transformational Leadership and Transactional Leadership - Challenges to the Leadership Construct.

UNIT: V

Group Behaviour:

Groups: Concept and Classification - Stages of Group Development - Group Structure - Roles and Norms - Group Decision-Making - Group vs Individual - Groupthink and Groups Shift - Group Decision Making Techniques and Process.

UNIT: VI

Organizational Culture and Organizational Change:

Concept - Dominant Culture - Strong vs Weak Cultures - Creating and Sustaining Culture – Conflict Management - Concept and Forces for Change -Managing Planned Changes - Resistance to Change -Approaches to Manage Organizational Change OrganizationalDevelopment.

REFERENCE:

1. Robbins, SP Stephen P, Timothy Judge and Nehasika Vohra, Organisational Behaviour, 12th or 16th edition, Pearson Education, 2011.
2. Fred Luthans, Organisational Behaviour, 11th edition, Mc Graw Hill, 2009.
3. W.Newstrom, John, Organisational Behaviour, 10th edition, Tata Mc Graw – Hill 2009.
4. Paul Heresy, Kenneth H. Blanchard, and Dewey E. Johnson, Management of Organisational Behaviour: Leading Human Resources, 2008.
5. Dr SS Khanka, Organisational Behaviour, S. Chand & Co, New Delhi, 2008.
6. Sanghi Seema, Organisational Behaviour, Pearson, 2011

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

IV B.Tech. II-Sem (CSE)

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(A0023196) BUSINESS ENVIRONMENT
(Open Elective-III)
(For Branches: ECE & CSE)

COURSE OBJECTIVES:

- ❖ To explore the concept of Business Environment
- ❖ To identify about environment analysis of business
- ❖ To analyse the monetary policy in India
- ❖ To impart knowledge about functioning and role of WTO
- ❖ To understand the role of Indian International trade
- ❖ To know the structure and functioning of stock markets

COURSE OUTCOMES:

- ❖ The students understands the concept and business process
- ❖ They know about the environment analysis
- ❖ The students understands the functions and role of monetary policy in India
- ❖ The students will be aware of WTO and functioning of FDI
- ❖ The student understand the role of International trade
- ❖ The students apply the knowledge in future investments

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	1	3	1	2	2			1			2	3	1
CO2				2		1	2			2		1			
CO3				3		2	2	2	2	1					
CO4	1			2		2	1	1	2	1			1		
CO5			2			3	2				2				2
CO6	1	1		1	1		2		2	2	1	2	1	1	

UNIT I**Introduction:**

Concept-Significance and Nature of B. Environment-Types of environment-Interaction between Internal and External environments-Nature and Structure of Economy-Techniques for Environment Analysis-Approaches and Significance of Environment Forecasting.

UNIT II**Technological, Demographic and Socio-Cultural Environment:**

Factors Influencing Technological Environment-Role and Impact of Technology on Business-Transfer of Technology – Channels, Methods, and Limitations- Changing age structure and its impact on business - Business and Culture.

UNIT III**Fiscal Policy**

Public revenues – Public Expenditure – Public debt – Evaluation of Fiscal policy of Government of India – Monetary Policy – Objectives - Demand and Supply of Money – Role of Finance Commission.

UNIT IV**Foreign Investment and Trade Regulation**

Foreign Direct Investment - Foreign Institutional Investment - WTO and India - Regulation of Foreign Trade - Disinvestment in Public Sector Units – TRIPS, TRIMS – GATT.

UNIT V**Industrial Policy:**

Meaning - Objective and Recent Development in New Economics Policy (1991) and its Impact on Business – Bilateral and Multilateral Trade Agreements – EXIM Policy and role of EXIM bank – Balance of Payments.

UNIT VI**Money Markets and Capital Markets:**

Features and components of Indian financial systems – Objectives, features and structure of Markets – Reforms and recent developments – SEBI –Investor protection and role of SEBI.

RECOMMENDED BOOKS:

1. Rangarajan, C.A.; Perspective in Economics, S.Chand & Sons, New Delhi
2. Cherunilam, Francis; Business Environment - Text and Cases, Himalaya Publishing House.
3. Aswathappa, K.; Essentials of Business Environment, Himalaya Publishing House, New Delhi

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IV B.Tech. II-Sem (CSE)

L	T	C
1	2	0.5

(A0554198) SCI LAB
(Skill Development Course)

COURSE OBJECTIVES:

- ❖ To provide knowledge on SCI lab environment.
- ❖ To provide knowledge on SCI lab workspace and working directory.
- ❖ To provide knowledge on matrices, graphs SCI lab functions.

COURSE OUTCOMES:

- ❖ Gains knowledge on SCI lab.
- ❖ Understands the SCI lab workspace and working directory.
- ❖ Understands various SCI lab functions and files operations.
- ❖ Student will be able to do polynomials problems
- ❖ Student will be able to do data structure problems
- ❖ Student will be able to do Statistical problems

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1			2			1	2	3	1				
CO2				2	2					2					
CO3				3	2					2					
CO4	2	2								2	1	1			
CO5		3	2							1					
CO6	3	2								2					

UNIT – I: Scilab environment

Scilab as an interactive calculator

UNIT-II: Scilab workspace and working directory

Creating matrices and some simple matrix operations

UNIT-III: Sub-matrices

Statistics

Working with polynomials

UNIT-IV: Plotting graphs

Scilab programming language

Script files and function files

UNIT-V: Writing Scilab functions

File operations

UNIT-VI: Reading Microsoft Excel files

Data Structures

TEXT BOOKS:

1. Scilab - A Hands on Introduction from Lulu

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L	T	C
0	0	0.5

(A0088198) COMPREHENSIVE VIVA – VIII
(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OUTCOMES:

Comprehensive Viva-Voce enables a successful student to

- ❖ Demonstrate knowledge in the program domain.
- ❖ Present his views cogently and precisely.
- ❖ Exhibit professional etiquette suitable for career progression.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3								2				2	2
CO2	3	2								3	3	3		2	3
CO3	3	3								2	3	3		3	3

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L	T	C
0	0	0.5

(A0086198) SEMINAR

(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ To develop skills in doing literature survey, technical presentation and report preparation.

COURSE OUTCOMES:

- ❖ The students will be able to analyze a current topic of professional interest and present it before an audience.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3		3		3	2	2		3	3	3			1	1

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IV B.Tech. II-Sem (CSE)

L	T	C
0	0	8

(A0087198) PROJECT PHASE-II/ INTERNSHIP

(For Branches: CE, EEE, Mech, ECE & CSE)

COURSE OBJECTIVES:

- ❖ To allow students to demonstrate a wide range of the skills learned at the College of Engineering during their course of study by asking them to deliver a product that has passed through the design, analysis, testing and evaluation
- ❖ To encourage multidisciplinary research through the integration learned in a number of courses.
- ❖ To allow students to develop problem solving, analysis, synthesis and evaluation skills.
- ❖ To encourage teamwork.
- ❖ To improve students' communication skills by asking them to produce both a professional report and a professional poster and to give an oral presentation

COURSE OUTCOMES:

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

- ❖ Review the current state of Art and trends in their area of interest and identify a suitable problem in their chosen subject domain with justification.
- ❖ Survey the available research literature/documents for the tools and techniques to be used.
- ❖ Examine the functional, non-functional, and performance requirements of their chosen problem definition.
- ❖ Design system architecture and different components and develop all the system components using appropriate tools and techniques.
- ❖ Work effectively in a team and use good project management practices and defend the project work as a team.

MAPPING WITH COs & POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3				3	3		3	3	3			3	3
CO2	3	3			2			3	2		3	3		3	3
CO3	3	3		2					2	3	3	3		3	3
CO4	3	3	3	3	3	3		2	2	3	3	3	2	3	3
CO5					3			2	3	3	3			3	3