ACADEMIC REGULATIONS

COURSE STRUCTURE

AND

DETAILED SYLLABUS

INFORMATION TECHNOLOGY

4 YEAR DEGREE COURSE
(Applicable for the batches admitted from 2018-2019)

REGULATION: R18
(I & II Year Syllabus)

J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY
(UGC Autonomous)
Bhaskar Nagar, Moinabad Mandal, R.R. District,
Hyderabad – 500 075, Telegana State, India

J.B. INSTITUTE OF ENGINEERING AND TECHNOLOGY (JBIET)
UGC AUTONOMOUS

Bhaskar Nagar, Yenkapally, Moinabad, Hyderabad – 500075, Telangana, India

ACADEMIC REGULATIONS FOR B.TECH. REGULAR STUDENTS

WITH EFFECT FROM ACADEMIC YEAR 2018-19 (R-18)

1.0 Under-Graduate Degree Programme in Engineering & Technology (UGP in E&T)

J.B.Institute of Engineering and Technology (JBIET) offers a 4-year (8 semesters) **Bachelor of Technology** (B.Tech.) degree programme, under Choice Based Credit System (CBCS) with effect from the academic year 2018-19 in the following branches of Engineering:

Sl. No.	Branch
1	Civil Engineering
2	Electrical and Electronics Engineering
3	Mechanical Engineering
4	Electronics and Communication Engineering
5	Computer Science and Engineering
6	Information Technology
7	Electronics and Computer Engineering
8	Mining Engineering

2.0 Eligibility for admission

2.1 Admission to the under graduate (UG) programme is made either on the basis of the merit rank obtained by the qualified student in entrance test conducted by the Telangana State Government (EAMCET) or on the basis of any other order of merit approved by the University, subject to reservations as prescribed by the government from time to time.

2.2 The medium of instructions for the entire under graduate programme in Engineering & Technology will be **English** only.

3.0 B.Tech. Programme structure

3.1 A student after securing admission shall complete the B.Tech. programme in a minimum period of **four** academic years (8 semesters), and a maximum period of **eight** academic years (16 semesters) starting from the date of commencement of first year first semester. However, he/she is permitted to write the examinations for two more years after eight academic years of course work, failing which he/she shall forfeit his/her seat in B.Tech course.

Each student shall secure 160 credits (with CGPA ≥ 5) required for the completion of the under graduate programme and award of the B.Tech. degree.

3.2 **UGC/AICTE** specified definitions/descriptions are adopted appropriately for various terms and abbreviations used in these academic regulations/ norms, which are listed below.

3.2.1 Semester scheme

Each undergraduate programme is divided into 4 academic years (8 semesters) with each semester of 22 weeks of duration (16 weeks for instruction), each semester having Continuous Internal Evaluation (CIE)' and 'Semester End Examination (SEE)'. Choice Based Credit System (CBCS) and Credit Based Promotion System (CBPS) as indicated by UGC and curriculum / course structure as suggested by AICTE are followed.

3.2.2 Credit courses

All subjects/ courses are to be registered by the student in a semester to earn credits which is assigned to each subject/ course in an L: T: P: C (lecture periods: tutorial periods: practical periods: credits) structure based on the following general pattern.

- One credit for one hour/ week/ semester for theory/ lecture (L) courses or tutorials.
- One credit for two hours/ week/ semester for laboratory/ practical (P) courses.

Courses like Environmental Science, Constitution of India, Intellectual Property Rights, and Gender Sensitization lab are mandatory courses. These courses will not carry any credits.

3.2.3 Subject Course Classification

All subjects/ courses offered for the under graduate programme in E&T (B.Tech. degree programmes) are broadly classified as follows. The College has followed almost all the guidelines issued by AICTE/UGC.

S. No.	Broad Course Classification	Course Group/ Category	Course Description
1	Foundation Courses (FnC)	BS – Basic Sciences	Includes mathematics, physics and chemistry subjects
2		ES-Engg Sciences	Includes fundamental engineering subjects
3		HS – Humanities and Social sciences	Includes subjects related to humanities, social sciences and management
4	Core Courses (CoC)	PC – Professional Core	Includes core subjects related to the parent discipline/ department/ branch of Engineering.
5		Project Work	B.Tech. project or UG project or UG major project or Project Stage I & II
6		Industrial training/ Mini- project	Industrial training/ Summer Internship/ Industrial Oriented Mini-project/ Mini-project
7	Elective Courses (EℓC)	PE – Professional Electives	Includes elective subjects related to the parent discipline/ department/ branch of Engineering.
8		OE – Open Electives	Elective subjects which include inter- disciplinary subjects or subjects in an area outside the parent discipline/ department/ branch of Engineering.

9		Seminar	Seminar/ Colloquium based on core contents related to parent discipline/ department/ branch of Engineering.
10	Minor courses	-	1 or 2 Credit courses (subset of HS)
11	Mandatory Courses (MC)	-	Mandatory courses (non-credit)

4.0 Course registration

4.1 A 'faculty advisor or counselor' is assigned to a group of 20 students, who will advise the students about the under graduate programme, its course structure and curriculum, choice/option for subjects/ courses, based on their competence, progress, pre-requisites and interest.

4.2 A student is allowed to register for 160 credits in completion of B.Tech programme. However, they can register for additional credits (above 160 credits). The additional credits scored shall not be considered for award of division and also not considered for calculation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA). For such extra course(s) registered, a certificate will be issued with a letter grade indicated as a performance measure.

4.3 **Open Electives**: The students have to choose requisite number of open electives (as prescribed in the course structure) from the list of open electives given. However, the student cannot opt for an open elective subject offered by his own (parent) department, if it is already listed under any category of the subjects offered by parent department in any semester.

4.4 **Professional Electives**: The students have to choose requisite number of professional electives (as prescribed in the course structure) from the list of professional electives given.

5.0 Subjects/ courses to be offered

5.1 A typical section (or class) strength for each semester is 60.

5.2 A subject/ course may be offered to the students, **only if** a minimum of 30 students (1/2 of the section strength) opt for it. The maximum strength of a section is limited to 80 (60 + 1/3 of the section strength).

5.3 More than one faculty member may offer the same subject (lab / practical may be included along with the corresponding theory subject in the same semester) in any semester. However, the selection of choice for students will be based on - 'first come, first serve basis and CGPA criterion' (i.e. first focus is on early on-line entry from the student for registration in that semester, and the second focus, if needed, will be on CGPA of the student).

5.4 If more entries for registration of a subject come into a picture, then the Head of the Department concerned shall decide, whether or not to offer such a subject/ course (Professional Elective and Open Electives) for **two (or multiple) sections**.

6.0 Attendance requirements:

6.1 A student is eligible to appear for the semester end examinations, if the student acquires a minimum of 75% of attendance in aggregate of all the subjects / courses (excluding attendance in mandatory courses) for that semester.

The attendance of Mandatory Non-Credit courses should be maintained separately.

6.2 Shortage of attendance in aggregate up to 10% (65% and above, and below 75%) in each semester may be condoned on medical grounds by the committee comprising of HOD of Concerned Department, Class incharge and 2 senior faculty members.

6.3 A stipulated condonation fee is payable for condoning of shortage of attendance. This fee will be informed time to time by the college administration.

6.4 Shortage of attendance below 65% in aggregate shall in **no** case be condoned.

6.5 A student detained in a semester due to shortage of attendance may be readmitted in the same semester in the next academic year for fulfillment of academic requirements. The academic regulations under which a student has been readmitted shall be applicable. However, no grade allotments or SGPA/ CGPA calculations will be done for the entire semester in which the student has been detained.

6.6 A student fulfilling the attendance requirement in the present semester shall not be eligible for readmission into the same class.

7.0 Academic requirements

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

7.1 A student is deemed to have fulfilled the minimum academic requirements and earned the credits allotted to each theory or practical or design or drawing course or project if he/she secures not less than 35% of marks (24 out of 70 marks) in the semester end examination and a minimum of 40% of marks in the sum total of the continuous internal evaluation (CIE) and semester end examination (SEE) taken together.

7.2 A student is deemed to have fulfilled the minimum academic requirements and earned the credits allotted to Industrial Oriented Mini Project /Summer Internship and seminar if the student secures not less than 40% marks in each of them.

7.3 A student may reappear once for each of the above evaluations, when they are scheduled again.

7.4 Promotion Rules

S. No.	Promotion	Conditions to be fulfilled
1	First year first semester to first year second semester	Regular course of study of first year first semester.

2	First year second semester to second year first semester	(i) Regular course of study of first year second semester. (ii) Must have secured at least 19 credits out of 38 credits i.e., 50% credits up to first year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3.	Second year first semester to second year second semester	Regular course of study of second year first semester.
4	Second year second semester to third year first semester	(i) Regular course of study of second year second semester. (ii) Must have secured at least 40 credits out of 80 credits i.e., 50% credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5	Third year first semester to third year second semester	Regular course of study of third year first semester.
6	Third year second semester to fourth year first semester	(i) Regular course of study of third year second semester. (ii) Must have secured at least 61 credits out of 122 credits i.e., 50% credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
7	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

7.5 A student eligible to appear in the semester end examination for any subject/ course, but absent from it or failed (thereby failing to secure **'C'** grade or above) may reappear for that subject/ course in the supplementary examination as and when conducted. In such cases, internal marks (CIE) assessed earlier for that subject/ course will be carried over, and added to the marks to be obtained in the SEE supplementary examination for evaluating performance in that subject.

7.6 A student **detained in a semester due to shortage of attendance may be re-admitted in the same semester in the next academic year for fulfillment of academic requirements**. The academic regulation under which a student has been readmitted is applicable. However, no grade allotments or SGPA/ CGPA calculations will be done for the entire semester in which the student has been detained.

7.7 A student detained **due to lack of credits, is promoted to the next academic year only after acquiring the required academic credits.** The academic regulation under which

the student has been readmitted is applicable to him.

7.8 A student who fails to earn all the 160 credits as indicated in the program structure within eight academic years from the year of admission shall forfeit his seat in B.Tech Program, unless an extension is given by college Academic council to complete the program for a further period of two years.

8.0 Evaluation - Distribution and Weightage of marks

8.1 The performance of a student in every subject/course (including practical and Project Stage – I & II) will be evaluated for 100 marks each, with 30 marks allotted for CIE (Continuous Internal Evaluation) and 70 marks for SEE (Semester End-Examination).

8.2 For theory courses, during the semester there are 2 mid-term examinations (internal exams of 20 marks each), 5 unit tests of 5 marks each and 2 assignments carrying 5 marks each.

8.3 Each mid-term examination will be of 1 hour 20 minutes consisting of Part-A (objective questions) for 10 marks and Part-B (long answer) for 10 marks. The objective paper is set with 20 bits of multiple choice, fill-in the blanks and matching type of questions. The Part- B consists of 2 questions each carrying 5 marks. For each question there will be "either" "or" choice.

8.4 Each Unit Test will be of 1 hour duration, consisting of 3 questions from that unit carrying 5 marks each and student should answer any two questions for 10 Marks. These 10 marks are scaled down to 5 for Unit Test marks calculation.

8.5 First mid-term examination is conducted for first 2 units of syllabus and second mid-term examination is conducted for remaining 3 units of syllabus.

8.6 The Continuous Internal Evaluation for theory course shall be made as average of marks obtained in CIE – I and CIE –II as detailed in the table below.

CIE – I	Marks	CIE - II	Marks
MID – I	20	MID - II	20
Best of Unit Test - I and Unit Test - II	5	Average of the best two of Unit Test – III, Unit Test – IV and Unit Test V	5
Assignment – I	5	Assignment - II	5
Total	30	Total	30

8.7 If a student is absent for any mid term examination, may be permitted to apply

for makeup examinations within a week after completion of mid-term examinations on medical grounds. A subcommittee with the following composition will look into such cases.

Subcommittee-composition:

S.No	Faculty Member	Designation
1	Concerned Head of the Department	Chairman
2	Faculty nominated by Principal	Member
3	Senior faculty member of the concerned Department	Member
4	Class Teacher of the class	Member

8.7.1 The semester end examinations (SEE) will be conducted for 70 marks consisting of two parts viz. i) **Part- A** for 20 marks, ii) **Part - B** for 50 marks.

- Part-A is a compulsory question consisting of ten sub-questions. The first five sub-questions are from each unit and carry 1 mark each. The next five sub-questions are one from each unit and carry 3 marks each.
- Part-B consists of five questions (numbered from 2 to 6) carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. For each question there will be an "either" "or" choice, which means that there will be two questions from each unit and the student should answer either of the two questions.

8.7.2 For subjects like **Engineering Graphics/Engineering Drawing,** the SEE shall consist of five questions. For each question there will be an "either" "or" choice, which means that there will be two questions from each unit and the student should answer either of the two questions. There is no Part – A, and Part – B system.

8.7.3 For subjects like **Machine Drawing Practice/Machine Drawing**, the SEE is conducted for 70 marks consisting of two parts viz. (i) Part – A for 30 marks. 3 out of 4 questions must be answered, (ii) Part – B for 40 marks. Part – B is compulsory with a single question.

8.7.4 For the Subject **Estimation, Costing and Project Management**, the SEE paper should consist of Part- A, Part-B and Part C. (i) Part – A – 1 out of 2 questions from Unit – I for 25 Marks, (ii) Part – B – 1 out of 2 questions from Unit – II for 15 Marks, (iii) Part – C – 3 out of 5 questions from Units – III, IV, V for 30 Marks.

8.7.5 For subjects **Structural Engineering – I & II (RCC & STEEL),** the SEE will be conducted for 70 marks consisting of 2 parts viz. (i) Part – A for 15 marks and, (i) Part – B for 55 marks. Part – A is a compulsory question consisting of ten sub- questions. The first five sub-questions are from each unit relating to design theory and codal provisions and carry 2 marks each. The next five sub-questions are from each unit and carry 1 mark each. Part – B consists of 5 questions (numbered 2 to 6) carrying 11 marks each. Each of

these questions is from one unit and may contain sub-questions. For each question there is either or choice, which means that there will be two questions from each unit and the student should answer either of the two questions.

8.8 For practical subjects there is a continuous internal evaluation during the semester for 30 marks and 70 marks for semester end examination. Out of the 30 marks for internal evaluation, day-to-day work in the laboratory is evaluated for 20 marks and internal practical examination is evaluated for 10 marks conducted by the laboratory teacher concerned. The semester end examination is conducted with an external examiner and the laboratory teacher. The external examiner is selected and appointed by the Principal from the list submitted by Head of the Department.

8.9 For the subject having design and/or drawing, (such as engineering graphics, engineering drawing, machine drawing, machine drawing practice and estimation), the distribution is 30 marks for continuous internal evaluation (20 marks for day-to-day work and 10 marks for internal tests) and 70 marks for semester end examination.

8.10 There is Life Skills and Professional Skills course offered for 2 credits and will be evaluated in IV year I semester as a laboratory course.

8.11 There is summer internship, in collaboration with an industry of their specialization, to be taken up during the vacation after II year II Semester examination and it will be evaluated in III Year I semester. A report to be submitted in prescribed format on the internship carried out by the student. The report will evaluated for 100 marks by the committee consisting of head of the department, and internship coordinator and a senior faculty member of the department. There is no semester end examination for the seminar

8.12 There is an Industry Oriented Mini Project, in collaboration with an industry of their specialization to be taken up during the vacation after III year II semester examinations. Industry Oriented Mini Project is submitted in a report form and presented before the committee in IV year I semester. It is evaluated for 100 marks by the committee consisting of Head of the Department, supervisor of the Industrial Oriented mini project and a senior faculty member of the department.

8.13 There is a seminar in IV year II semester. For the seminar, the student shall collect the information on a specialized topic, prepare a technical report, and submit it to the department. It is evaluated by the departmental committee consisting of Head of the Department, seminar supervisor and a senior faculty member. The seminar report is evaluated for 100 internal marks. There is no semester end examination for the seminar.

8.14 UG project work shall be carried out in two stages: Project Stage – I during IV Year I Semester, Project Stage – II during IV Year II Semester. Each stage will be evaluated for 100 marks. Student has to submit project work report at the end of each semester. First report includes project work carried out in IV Year I semester and second report includes project work carried out in IV Year I & II Semesters. SEE for both project stages shall be completed before the commencement of SEE Theory examinations..

8.15 For Project Stage – I, the Project Review committee (PRC) consisting of Head of the Department, project coordinator and two senior faculty members shall evaluate(SEE) the project work for 70 marks and project supervisor (CIE) shall evaluate for 30 marks. The student is deemed to have failed, if he (i) does not submit a report on Project Stage - I or does not make a presentation of the same before the evaluation committee as per schedule, or (ii) secures less than 40% marks in the sum total of the CIE and SEE taken together..

A student who has failed may reappear once for the above evaluation, when it is scheduled again; if he fails in such 'one reappearance' evaluation also, he has to reappear for the same in the next subsequent semester, as and when it is scheduled.

8.16 For Project Stage – II, the external examiner shall evaluate the project work for 70 marks and the project supervisor shall evaluate it for 30 marks. The student is deemed to have failed, if he (i) does not submit a report on Project Stage - II, or does not make a presentation of the same before the external examiner as per schedule, or (ii) secures less than 40% marks in the sum total of the CIE and SEE taken together.

For conducting viva-voce of project stage – II, Principal selects an external examiner from the list of experts in the relevant branch submitted by the HODs of the College.

A student who has failed may reappear once for the above evaluation, when it is scheduled again; if student fails in such 'one reappearance' evaluation also, he has to reappear for the same in the next subsequent semester, as and when it is scheduled.

8.17 For mandatory courses of Environmental Science, Constitution of India, Intellectual Property Rights, and Gender Sensitization lab, a student has to secure 40 marks out of 100 marks (i.e. 40% of the marks allotted) in the continuous internal evaluation for passing the subject/course. **These marks should also be submitted along with the internal marks of other subjects.**

8.18 No marks or letter grades is printed in the Mark Statement for mandatory/non-credit courses. Only Pass/Fail is indicated in Grade Card.

9.0 Grading procedure

9.1 Grades will be awarded to indicate the performance of students in each theory subject, laboratory / practicals, seminar, Industry Oriented Mini Project, and project Stage - I & II. Based on the percentage of marks obtained (Continuous Internal Evaluation plus Semester End Examination, both taken together) as specified in item 8 above, a corresponding letter grade is given.

9.2 As a measure of the performance of a student, a 10-point absolute grading system using the following letter grades (as per UGC/AICTE guidelines) and corresponding percentage of marks is followed:

% of Marks Secured in a Subject/Course (Class Intervals)	Letter Grade (UGC Guidelines)	Grade Points
Greater than or equal to 90%	O (Outstanding)	10

80 and less than 90%	A^+ (Excellent)	9
70 and less than 80%	A (Very Good)	8
60 and less than 70%	B^+ (Good)	7
50 and less than 60%	B (Average)	6
40 and less than 50%	C (Pass)	5
Below 40%	F (FAIL)	0
Absent	Ab	0

9.3 A student who has obtained an '**F'** grade in any subject is deemed to have '**failed'** and is required to reappear as a 'supplementary student' in the semester end examination, as and when offered. In such cases, internal marks in those subjects will remain the same as those obtained earlier.

9.4 To a student who has not appeared for an examination in any subject, '**Ab'** grade will be allocated in that subject, and he is deemed to have '**failed'**. A student will be required to reappear as a 'supplementary student' in the semester end examination, as and when offered next. In this case also, the internal marks in those subjects will remain the same as those obtained earlier.

9.5 A letter grade does not indicate any specific percentage of marks secured by the student, but it indicates only the range of percentage of marks.

9.6 A student earns grade point (GP) in each subject/ course, on the basis of the letter grade secured in that subject/ course. The corresponding 'credit points' (CP) are computed by multiplying the grade point with credits for that particular subject/ course.

Credit points (CP) = grade point (GP) x credits …. For a course

9.7 A student passes the subject/ course only when **GP ≥ 5 ('C' grade or above).**

9.8 The Semester Grade Point Average (SGPA) is calculated by dividing the sum of credit points (∑CP) secured from all subjects/ courses registered in a semester, by the total number of credits registered during that semester. SGPA is rounded off to **two** decimal places. SGPA is thus computed as

$$\text{SGPA} = \{ \sum_{i=1}^{N} C_i G_i \} / \{ \sum_{i=1}^{N} C_i \} \text{ …. For each semester,}$$

where 'i' is the subject indicator index (takes into account all subjects in a semester), 'N' is the no. of subjects '**registered'** for the semester (as specifically required and listed under the course structure of the parent department), C_i is the no. of credits allotted to the i^{th} subject, and G_i represents the grade points (GP) corresponding to the letter grade awarded for that i^{th} subject.

9.9 The Cumulative Grade Point Average (CGPA) is a measure of the overall cumulative performance of a student in all semesters considered for registration. The CGPA is the ratio of the total credit points secured by a student in **all** registered courses in **all** semesters, and the total number of credits registered in **all** the semesters. CGPA is rounded off to **two** decimal places. CGPA is thus computed from the I year II semester onwards at the end of each semester as per the formula

$$\text{CGPA} = \{ \sum_{j=1}^{M} C_j G_j \} / \{ \sum_{j=1}^{M} C_j \} \text{ ... for all S number of semesters registered}$$

(i.e., up to and inclusive of S semesters, S ≥ 2),

where '**M'** is the **total** no. of subjects (as specifically required and listed under the course structure of the parent department) the student has '**registered'** i.e., from the 1st semester onwards up to and inclusive of the 8th semester, 'j' is the subject indicator index (takes into account all subjects from 1 to 8 semesters), C_j is the no. of credits allotted to the j^{th} subject, and G_j represents the grade points (GP) corresponding to the letter grade awarded for that j^{th} subject. After registration and completion of I year I semester, the SGPA of that semester itself may be taken as the CGPA, as there are no cumulative effects.

Illustration of calculation of SGPA:

Course/Subject	Credits	Letter Grade	Grade Points	Credit Points
Course 1	4	A	8	4 x 8 = 32
Course 2	4	O	10	4 x 10 = 40
Course 3	4	C	5	4 x 5 = 20
Course 4	3	B	6	3 x 6 = 18
Course 5	3	A+	9	3 x 9 = 27
Course 6	3	C	5	3 x 5 = 15
	21			152

SGPA = 152/21 = 7.24

Illustration of calculation of CGPA up to 3rd semester:

Semester	Course/Subject Title	Credits Allotted	Letter Grade Secured	Corresponding Grade Point (GP)	Credit Points (CP)
I	Course 1	3	A	8	24
I	Course 2	3	O	10	30
I	Course 3	3	B	6	18
I	Course 4	4	A	8	32
I	Course 5	3	A+	9	27
I	Course 6	4	C	5	20
II	Course 7	4	B	6	24
II	Course 8	4	A	8	32
II	Course 9	3	C	5	15
II	Course 10	3	O	10	30
II	Course 11	3	B+	7	21
II	Course 12	4	B	6	24
II	Course 13	4	A	8	32
II	Course 14	3	O	10	30
III	Course 15	2	A	8	16
III	Course 16	1	C	5	5
III	Course 17	4	O	10	40
III	Course 18	3	B+	7	21
III	Course 19	4	B	6	24
III	Course 20	4	A	8	32
III	Course 21	3	B+	7	21
	Total Credits	**69**		**Total Credit Points**	**518**

CGPA = 518/69 = 7.51

The above illustrated calculation process of CGPA will be followed for each subsequent semester until 8th semester. The CGPA obtained at the end of 8th semester will become the final CGPA secured for entire B.Tech. Programme.

9.10 For merit ranking or comparison purposes or any other listing, **only** the '**rounded off**' values of the CGPAs will be used.

9.11 SGPA and CGPA of a semester will be mentioned in the semester Memorandum of Grades if all subjects of that semester are passed in first attempt. Otherwise the SGPA and CGPA is mentioned only on the Memorandum of Grades in which sitting he passed his last exam in that semester. However, mandatory courses will not be taken into consideration.

10.0 Passing standards

10.1 A student is declared successful or 'passed' in a semester, if he secures a GP ≥ 5 ('C' grade or above) in every subject/course in that semester (i.e. when the student gets an SGPA ≥ 5.00 at the end of that particular semester); and he is declared successful or 'passed' in the entire under graduate programme, only when gets a CGPA ≥ 5.00 for the award of the degree as required.

10.2 After the completion of each semester, a grade card or grade sheet is issued to all the registered students of that semester, indicating the letter grades and credits earned. It will show the details of the courses registered (course code, title, no. of credits, grade earned, etc.), credits earned.

11.0 Declaration of results

11.1 Computation of SGPA and CGPA are done using the procedure listed in 9.6 to 9.9.

11.2 For final percentage of marks equivalent to the computed final CGPA, the following formula may be used.

% of Marks = (final CGPA – 0.5) x 10

12.0 Award of degree

12.1 A student who registers for all the specified subjects/ courses as listed in the course structure and secures the required number of 160 credits (with CGPA ≥ 5.0), within 8 academic years from the date of commencement of the first academic year, is declared to have '**qualified'** for the award of B.Tech. degree in the chosen branch of Engineering selected at the time of admission.

12.2 A student who qualifies for the award of the degree as listed in item 12.1 is placed in the following classes.

12.3 A student with final CGPA (at the end of the under graduate programme) ≥ 8.00, and fulfilling the following conditions - is placed in '**first class with distinction'**.

However, he

(i) Should have passed all the subjects/courses in '**first appearance'** within the first 4 academic years (or 8 sequential semesters) from the date of commencement of first year first semester.

(ii) Should have secured a CGPA ≥ 8.00, at the end of each of the 8 sequential semesters, starting from I year I semester onwards.

(iii) Should not have been detained or prevented from writing the semester end examinations in any semester due to shortage of attendance or any other reason.

A student not fulfilling any of the above conditions with final CGPA > 8 is placed in **'first class'.**

12.4 Students with final CGPA (at the end of the under graduate programme) ≥ 6.50 but < 8.00 are placed in **'first class'.**

12.5 Students with final CGPA (at the end of the under graduate programme) ≥ 5.50 but < 6.50, are placed in '**second class'**.

12.6 All other students who qualify for the award of the degree (as per item 12.1), with final CGPA (at the end of the under graduate programme) ≥ 5.00 but < 5.50, are placed in '**pass class**'.

12.7 A student with final CGPA (at the end of the under graduate programme) < 5.00 will not be eligible for the award of the degree.

12.8 Students fulfilling the conditions listed under item 12.3 alone will be eligible for award of '**Gold Medal**'.

13.0 Withholding of results

13.1 If the student has not paid the fees to the College at any stage, or has dues pending due to any reason whatsoever, or if any case of indiscipline is pending, the result of the student may be withheld, and the student will not be allowed to go into the next higher semester. The award or issue of the degree may also be withheld in such cases.

14.0 Student transfers

Transfer of students from other colleges or universities are permitted subjected to the rules and regulations of Telanga State Council for Higher Education (Technical Education Department) and JNTUH in vogue.

15.0 Scope

15.1 The academic regulations should be read as a whole, for the purpose of any interpretation.

15.2 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.

15.3 The College may change or amend the academic regulations, course structure or syllabi at any time, and the changes or amendments made is applicable to all students with effect from the dates notified by the College authorities.

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

ACADEMIC REGULATIONS FOR B.TECH. (LATERAL ENTRY SCHEME) FROM THE AY 2019-2020

1. Eligibility for award of B. Tech. Degree (LES)

The LES students after securing admission shall pursue a course of study for not less than three academic years and not more than six academic years.

2. The student shall register for 122 credits and secure 122 credits with CGPA ≥ 5 from II year to IV year B.Tech. programme (LES) for the award of B.Tech. degree.

3. The students, who fail to fulfill the requirement for the award of the degree in six academic years from the year of admission. However, he/she is permitted to write the examinations for two more years after six academic years of course work, failing which he/she shall forfeit his/her seat in B.Tech course.

4. The attendance requirement of B. Tech. (Regular) is applicable to B.Tech. (LES).

5. Promotion rule

S. No	Promotion	Conditions to be fulfilled
1	Second year first semester to second year second semester	Regular course of study of second year first semester.
2	Second year second semester to third year first semester	**(i)** Regular course of study of second year second semester. **(ii)** Must have secured at least 21 credits out of 42 credits i.e., 50% credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3	Third year first semester to third year second semester	Regular course of study of third year first semester.
4	Third year second semester to fourth year first semester	(i) Regular course of study of third year second semester. (ii) Must have secured at least 42 credits out of 84 credits i.e., 50% credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not**.**
5	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

6. All the other regulations as applicable to B. Tech. 4-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme).

MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper conduct	Punishment
	If the student:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which student is appearing but has not made use of (material shall include any marks on the body of the student which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other student orally or by any other body language methods or communicates through cell phones with any student or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the students involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the student is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year.

3.	Impersonates any other student in connection with the examination.	The student who has impersonated is expelled from examination hall. The student is also debarred and forfeits the seat. The performance of the original student who has been impersonated, is cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all End examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the student has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all End examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the chief superintendent/assistant – superintendent / any officer on duty or	In case of students of the college, they is expelled from examination halls and cancellation of their performance in that

	misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the college campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	subject and all other subjects the student(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The students also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a Police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears off the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the student has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that Semester/year. The student is also debarred for two consecutive semesters from class work and all End examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat.
8.	Possesses any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and project work and shall not be permitted for the

		remaining examinations of the subjects of that semester/year. The student is also debarred and forfeits the seat.
9.	If student of the college, who is not a student for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred and forfeits the seat. Person(s) who do not belong to the college will be handed over to the police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared for including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the student has appeared for including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 is reported to the Examination Result Processing Committee (ERPC) for further action to award a suitable punishment.	

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J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

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INFORMATION TECHNOLOGY

COURSE STRUCTURE – R18

I B.Tech – I Semester

Sl. No	Category Code	Course Title	L	T	P	Credits
1	F110A	Mathematics - I	3	1	0	4
2	F110C	Applied Physics	3	1	0	4
3	F112A	Basic Electrical Engineering	3	1	0	4
4	F1105	Basic Electrical Engineering Lab	0	0	2	1
5	F1104	Applied Physics Lab	0	0	3	1.5
6	F1106	Workshop and Manufacturing Practices	1	0	4	3
7		Induction Programme				
		Total Credits	**10**	**3**	**9**	**17.5**

I B.Tech – II Semester

Sl. No	Category Code	Course Title	L	T	P	Credits
1	F120A	Mathematics - II	3	1	0	4
2	F120B	English	2	0	0	2
3	F125A	Programming for Problem Solving	3	0	0	3
4	F120D	Engineering Chemistry	3	1	0	4
5	F123A	Engineering Drawing & Computer Graphics	1	0	4	3
6	F1201	English Language and Communication Skills Lab	0	0	2	1
7	F1206	Programming for Problem Solving Lab	0	0	4	2
8	F1203	Chemistry Lab	0	0	3	1.5
		Total Credits	**12**	**2**	**13**	**20.5**

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COURSE STRUCTURE – R18

II B.Tech – I Semester

Sl. No	Category Code	Course Title	L	T	P/D	Credits
1	F215A	Data Structures	3	0	0	3
2	F215B	Operating Systems	3	0	0	3
3	F216A	Database Management Systems	3	0	0	3
4	F210E	Professional Ethics	3	0	0	3
5	F210B	Probability and Statistics	3	1	0	4
6	F210C	Gender Sensitization	2	0	0	0
7	F2161	Database Management Systems Lab	0	0	4	2
8	F2151	Data structures Lab	0	0	3	1.5
9	F2152	Operating Systems Lab	0	0	3	1.5
		Total Credits	**17**	**1**	**10**	**21**

II B.Tech – II Semester

Sl. No	Category Code	Course Title	L	T	P/D	Credits
1	F225A	Object Oriented Programming through Java	3	0	0	3
2	F225B	Digital Logic Design and Computer Organization	3	0	0	3
3	F225C	Design and Analysis of Algorithms	3	1	0	4
4	F226A	Computer Networks	3	0	0	3
5	F226B	Mathematical Foundation for Computer Science	3	0	0	2
6	F220D	Biological Science	2	0	0	2
7	F220E	Environmental Sciences	2	0	0	0
8	F2261	Computer Networks Lab	0	0	4	2
9	F2251	Object Oriented Programming through Java Lab	0	0	4	2
		Total Credits	**19**	**1**	**8**	**21**

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COURSE STRUCTURE – R18

III B.Tech – I Semester

Sl. No	Category Code	Course Title	L	T	P/D	Credits
1	PCC	Python Programming	3	0	0	3
2	PCC	Software Engineering	3	0	0	3
3	PCC	Automata and Compiler Design	3	0	0	3
4	PCC	Data Warehousing and Data Mining	3	0	0	3
5	HSM	Managerial Economics and Financial Analysis	3	0	0	3
6	PCC	Python Programming Lab	0	0	4	2
7	PCC	Software Engineering Lab	0	0	3	1.5
8	PCC	Data Mining Lab	0	0	3	1.5
9	SUM INT	Summer Internship	0	0	2	1
		Total Credits	**15**	**0**	**12**	**21**

III B.Tech – II Semester

Sl. No	Category Code	Course Title	L	T	P/D	Credits
1	PCC	Web Technologies	3	0	0	3
2	PCC	Linux Programming	3	0	0	3
3	HSM	Management Science	3	0	0	3
4	PE	Professional Elective-I	3	0	0	3
5	PE	Professional Elective-II	3	0	0	3
6	OE	Open Elective-I	3	0	0	3
7	PCC	Web Technologies Lab	0	0	3	1.5
8	PCC	Linux Programming Lab	0	0	3	1.5
		Total Credits	**18**	**0**	**6**	**21**

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COURSE STRUCTURE – R18

IV B.Tech – I Semester

Sl. No	Category Code	Course Title	L	T	P/D	Credits
1	PE	Professional Elective-III	3	0	0	3
2	PE	Professional Elective-IV	3	0	0	3
3	OE	Open Elective-II	3	0	0	3
4	OE	Open Elective-III	3	0	0	3
5	HSM	Life skills and Professional Skills Lab	0	0	4	2
6	IMP	Industry Oriented Mini Project	0	0	4	2
7	PROJ 1	Project Stage-I	0	0	8	4
		Total Credits	**12**	**0**	**16**	**20**

IV B.Tech – II Semester

Sl. No	Category Code	Course Title	L	T	P/D	Credits
1	PE	Professional Elective-V	3	0	0	3
2	PE	Professional Elective-VI	3	0	0	3
3	OE	Open Elective-IV	3	0	0	3
4	SEM	Seminar	0	0	2	1
5	PROJ 2	Project Stage-II	0	0	16	8
		Total Credits	**9**	**0**	**18**	**18**
					160	

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COURSE STRUCTURE – R18

Professional Elective - I

Sl. No	Category Code	Subject	L	T-P-D	C
1	PE-I	Principles of Programming Languages	3	0-0-0	3
2	PE-I	Wireless Networks and Mobile Computing	3	0-0-0	3
3	PE-I	Ad hoc Sensor Networks	3	0-0-0	3

Professional Elective - II

Sl. No	Category Code	Subject	L	T-P-D	C
1	PE-II	Software Testing Methodologies	3	0-0-0	3
2	PE-II	Information Retrieval Systems	3	0-0-0	3
3	PE-II	Cloud Computing	3	0-0-0	3

Professional Elective - III

Sl. No	Category Code	Subject	L	T-P-D	C
1	PE-III	Internet of Things	3	0-0-0	3
2	PE-III	Distributed Database	3	0-0-0	3
3	PE-III	Big Data Analytics	3	0-0-0	3

Professional Elective - IV

Sl. No	Category Code	Subject	L	T-P-D	C
1	PE-IV	Web Services	3	0-0-0	3
2	PE-IV	Software Process and Project Management	3	0-0-0	3
3	PE-IV	Software Architecture and Design Pattern	3	0-0-0	3

Professional Elective - V

Sl. No	Category Code	Subject	L	T-P-D	C
1	PE-V	Database Security	3	0-0-0	3
2	PE-V	Information Security	3	0-0-0	3
3	PE-V	Cyber Security	3	0-0-0	3

Professional Elective - VI

Sl. No	Category Code	Subject	L	T-P-D	C
1	PE-VI	Blockchain Technology	3	0-0-0	3
2	PE-VI	Storage Area Networks	3	0-0-0	3
3	PE-VI	Android Application Development	3	0-0-0	3

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COURSE STRUCTURE – R18

Open Elective - I

Sl. No	Category Code	Subject	L	T-P-D	C
1	OE-I	Introduction to Data Structures	3	0-0-0	3
2	OE-I	Introduction to Web Design	3	0-0-0	3

Open Elective - II

Sl. No	Category Code	Subject	L	T-P-D	C
1	OE-II	Computer Organization	3	0-0-0	3
2	OE-II	Human Computer Interaction	3	0-0-0	3

Open Elective - III

Sl. No	Category Code	Subject	L	T-P-D	C
1	OE-III	Java Programming	3	0-0-0	3
2	OE-III	Software Project Management	3	0-0-0	3

Open Elective - IV

Sl. No	Category Code	Subject	L	T-P-D	C
1	OE-IV	Computer Forensics	3	0-0-0	3
2	OE-IV	E-Disaster Management	3	0-0-0	3

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B.Tech.: IT	**L**	**T-P-D**	**C**
I Year -I Semester	**3**	**1-0-0**	**4**

(F110A) MATHEMATICS-I
(LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS)
(COMMON TO CE, EEE, ME, ECE, CSE, IT, ECM & MIE)

Course objectives:
At the end of the course, students will :

1. To study matrix algebra and its use in solving system of linear equations and in solving Eigen value problems.
2. To provide an over view of Ordinary differential equations in First order & Higher order.
3. To learn the concept of Sequence & nature of series.

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

1. Solve system of linear equations and eigen value problems.
2. Identify whether the given differential equation of first order is exact or not
3. Solve higher differential equation and apply the concept of differential equation to real world problems
4. Find the nature of sequences & series.

UNIT – I: MATRICES : (10L)

Matrices: Types of Matrices, Symmetric; Hermitian; Skew-symmetric; Skew-Hermitian; orthogonal matrices; Unitary Matrices; rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method;

System of linear equations; solving system of Homogeneous and Non-Homogeneous equations. Gauss elimination method; Gauss Seidel Iteration Method.

UNIT – II: EIGEN VALUES and EIGEN VECTORS: (10L)

Linear Transformation and Orthogonal Transformation: Eigen values and Eigenvectors and their properties: Diagonalization of a matrix;

Cayley-Hamilton Theorem (without proof); finding inverse and power of a matrix by Cayley-Hamilton Theorem; Quadratic forms and Nature of the Quadratic Forms; Reduction of Quadratic form to canonical forms by Orthogonal Transformation

UNIT – III : SEQUENCES and SERIES: (10L)

Sequence: Definition of a Sequence, limit; Convergent, Divergent and Oscillatory sequences.
Series: Convergent, Divergent and Oscillatory Series; Series of positive terms; Comparison test, p-test, D-Alembert's ratio test; Raabe's test; Cauchy's Integral test; Cauchy's root test; logarithmic test. Alternating series: Leibnitz test;
Alternating Convergent series: Absolute and Conditionally Convergence

UNIT – IV: FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS: (8L)

Exact, linear and Bernoulli's equations; Applications: Newton's law of cooling, Law of natural growth and decay;
Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

UNIT – V : ORDINARY DIFFERENTIAL EQUATIONS OF HIGHER ORDER : (10L)

Second order linear differential equations with constant coefficients: Non-Homogeneous terms of the type $e^{ax}, \sin ax, \cos ax,$ polynomials in x, $e^{ax}V(x)$ and $x\,V(x)$;
method of variation of parameters; Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Euler equation.

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006.
3. R.K.Jain& S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 4th Edition, 2014.

REFERENCES:

1. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, LaxmiPublications, Reprint, 2008.
2. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi,11thReprint, 2010.

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B.Tech.: IT	**L**	**T-P-D**	**C**
I Year -I Semester	**3**	**1-0-0**	**4**

(F110C) APPLIED PHYSICS
(Common To CSE & IT)

Course objectives:
At the end of the course, students will :

1. Demonstrate skills in scientific inquiry, problemsolving and laboratory techniques.
2. Demonstrate competency and understanding of the concepts found in Quantum Mechanics, Semiconductor physics, Fiber optics and lasers and Electromagnetic theory and a broad base of knowledge in physics.
3. Solve non-traditional problems that potentially draw on knowledge in multiple areas of physics.
4. study applications in engineering like memory devices, transformer core and electromagnetic machinery.

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

1. learn the fundamental concepts on Quantum behaviour of matter in its micro state
2. Get the knowledge of fundamentals of Semiconductor physics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
3. Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
4. Be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.

UNIT-I: Quantum Mechanics:

Introduction to quantum physics, Black body radiation, Planck's law, Photoelectric effect, Compton effect, de-Broglie's hypothesis, Wave-particle duality, Davisson and Germer experiment,
Heisenberg's Uncertainty principle, Born's interpretation of the wave function, Schrodinger's time independent wave equation, Particle in one dimensional box.

UNIT-II: Electronic Materials:

Classical Free electron theory, Quantum free electron theory, Fermi energy level, Occupation probability, Density of States, Bloch Theorem, Kronig- Penny model,
E-K Diagram, Effective mass of Electron, Band Theory of solids, Classification of materials.

UNIT-III: Semiconductor Physics:

Intrinsic and Extrinsic semiconductors, Carrier Concentration in intrinsic and extrinsic Semiconductors, Dependence of Fermi level on carrier-concentration and temperature, Carrier generation and recombination.
Carrier transport: diffusion and drift, p-n junction diode, V-I Characteristic, Diode equation(qualitative treatment), Zener diode , Hall effect, LED, Photo diode and Solar cell.

UNIT-IV: Lasers and Fibre Optics :

Lasers: Introduction, absorption, spontaneous emission, Stimulated emission, calculation of Einstein co-efficient, Population inversion, Pumping, Lasing action, Types of Lasers: Ruby laser, He-Ne laser, Semiconductor laser, Applications of laser.
Fibre Optics: Introduction, Construction and working principle of Optical fibre, Acceptance angle, Acceptance cone and Numerical aperture, Types of optical fibres, Applications of optical fibres.

UNIT-V: Electromagnetism:

Laws of electrostatics, Electric current and the continuity equation, Ampere's and Faraday's laws, Maxwell's equations, The wave equation: Plane Electromagnetic waves in vacuum, their Transverse nature,
Polarisation, Permittivity and Dielectric constant, Internal fields in a solid, Clausius-Mossotti equation, Ferroelectrics and Piezoelectric.

TEXT BOOKS:

1. B.K. Pandey, S. ChaturvediEngineering Physics, CengageLearing.
2. Halliday and Resnick, Physics, Wiley.
3. Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar - Chand,A textbook of Engineering Physics, Chand

REFERENCES:

1. Richard Robinett, Quantum Mechanics
2. SJ.Singh, emiconductor Optoelectronics: Physics and Technology, McGraw-Hill inc. (1995).
3. by Monica Katiyar and Deepak GupthaOnline Course: "Optoelectronic Materials and Devices" on NPTEL.
4. P.K.Palanisamy, "Engineering Physics", Scitech Publications, Fourth edition.

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B.Tech.: IT	**L**	**T-P-D**	**C**
I Year -I Semester	**3**	**1-0-0**	**4**

(F112A) BASIC ELECTRICAL ENGINEERING
(COMMON TO CE, ME, CSE, IT & MIE)

Course objectives:
At the end of the course, students will :

1. To introduce the concepts of electrical circuits and its components.
2. To understand magnetic circuits, DC circuits and AC single phase and three phase circuits.
3. To study and understand the different types of DC/AC machines and transformers.
4. To import the knowledge of various electrical installations.

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

1. To analyze and solve electrical circuits using network laws and theorems.
2. To understand and analyze basic electric and magnetic circuits.
3. To get an exposure of working principles of electrical machines.
4. To introduce components of low voltage electrical installations.

UNIT-I: DC Circuits: Electrical circuit elements (R, L and C), voltage and current sources, Kirchhoff's current and voltage laws, analysis of simple circuits with DC excitation.
Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits.

UNIT –II: AC Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor.
Analysis of single-phase AC circuits consisting of R, L, C, RL, RC and RLC series combinations, resonance in series RLC circuit. Three phase balanced circuits, voltage and current relations in star and delta connections.

UNIT-III: Transformers: Magnetic materials, BH characteristics, ideal and practical transformer, equivalent circuit.
losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections.

UNIT-IV: Rotating Electrical Machines: D.C Motors - principle of operation, characteristics, speed control and application of series and shunt motor.
Three-phase induction motor - construction, generation of rotating magnetic fields, principle of operation, torque-slip characteristics. Single-phase induction motor - construction, working, torque-speed characteristic.

UNIT –V: Electrical Installations: Components of LT switchgear: Switch fuse unit (SFU), MCB, ELCB, MCCB, types of wires and cables, earthing.
Types of batteries, important characteristics for batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

TEXT BOOKS :

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
3. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.

REFERENCES:

1. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
2. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.

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B.Tech.: IT	**L**	**T – P-D**	**C**
I Year -I Semester	**0**	**0 – 2 - 0**	**1**

(F1105) BASIC ELECTRICAL ENGINEERING LAB
(COMMON TO CE, ME, CSE, IT & MIE)

Course objectives:

At the end of the course, students will :

1. To analyze a given network by applying various electrical laws and network theorems.
2. To know the response of electrical circuits for different excitations.
3. To calculate, measure and know the relation between basic electrical parameters.
4. To analyze the performance characteristics of DC andAC electrical machines.

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

1. Get an exposure to basic electrical laws.
2. Relate the response of different types of electrical circuits to different excitations.
3. Understand the measurement, calculation and relation between the basic electrical parameters
4. Inspect the basic characteristics of transformers and electrical machines.

Choice of 10-12 experiments from the following

List of Experiments

1. Verification of Ohms Law.
2. Verification of KVL and KCL.
3. Transient response of series RL and RC circuits using DC excitation.
4. Transient response of RLC series circuit using DC excitation.
5. Resonance in series RLC circuit.
6. Calculations and verification of impedance and current of RL, RC and RLC series circuits.
7. B-H loop for single phase transformers.
8. Measurement of voltage, current and real power in primary and secondary circuits of a single phase transformer.
9. Load test on single phase transformer (Calculate Efficiency and Regulation).
10. Three phase transformer: Verification of relationship between voltages and currents (Star-Delta, Delta-Delta, Delta-star, Star-Star).
11. Measurement of active and reactive power in a balanced three-phase circuit.

12. Performance Characteristics ofa DC Shunt Motor.
13. Torque-Speed Characteristics of a DC Shunt Motor.
14. Performance Characteristics of a Three-phase Induction Motor.

15. Torque-speed Characteristics of a Three-phase Induction Motor.

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B.Tech.: IT	**L**	**T – P - D**	**C**
I Year -I Semester	**0**	**0 – 3 - 0**	**1.5**

(F1104) APPLIED PHYSICS LAB
(COMMON TO CSE & IT)

Course objectives:
At the end of the course, students will :

1. Demonstrate skills in scientific inquiry, problem solving and laboratory techniques.
2. Demonstrate competency and understanding of the concepts found in LED, Electric and Electronic materials a broad base of knowledge in physics.
3. Solve Experimental problems that potentially draw an experimental knowledge in multiple areas of physics.
4. Study applications in engineering like Hall effect, Optical fibre, LASER, Photodiode and Solar cell.

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

1. Learn the experimental concepts on in LED, Electric and Electronic materials.
2. Get the knowledge of fundamentals of Semiconductor physics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
3. Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
4. Be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.

List of Experiments:

1. Energy gap of P-N junction diode:
   To determine the energy gap of a semiconductor diode.
2. Solar Cell:
   To study the V-I Characteristics of solar cell.
3. Light emitting diode:
   Plot V-I and P-I characteristics of light emitting diode.
4. Optical fiber:
   Determination of Numerical Aperture.

5. Hall effect:
   To determine Hall co-efficient of a given semiconductor.
6. Photoelectric effect:
   To determine work function of a given material.
7. LASER:
   To study the Wave length of LASER Source.
8. Dielectric constant:
   To determine the Dielectric constant of the given material.
9. LCR Circuit:
   To determine the Quality factor of LCR Circuit (Series& Parallel).
10. R-C Circuit:
    To determine the time constant of R-C circuit (Growth and Decay).

Text Books:

1. Dr. Narendra, L. Mathakari, "Experiments in Applied Physics" (Physics Lab Manual 4^{th} edition) ,
2. " Engineering Physics Lab Manual" By Department of Physics JBIET

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B.Tech : IT	**L**	**T-P-D**	**C**
I Year -I Semester	**1**	**0-4-0**	**3**

(F1106) WORKSHOP AND MANUFACTURING PRACTICES
(COMMON TO EEE, CSE & IT)

Pre-requisites: None

Course objectives:
At the end of the course, students will :

1. Learn fabricating small components using engineering tools and machines
2. Understand the working principles of maintaining dimensional accuracies and dimensional tolerances in different manufacturing processes
3. Understand assembly of various components.

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

1. Fabricate components with their own hands.
2. Get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.
3. Produce small components of their interest by assembly

(I) WORKSHOP AND MANUFACTURING PRACTICES – 10 Lecture hours

1.Brief introduction to Manufacturing processes : –
   a. machining on lathe, milling and drilling machines,
   b. basic process involved in the casting,
   c. brief process of forging , forming,
   d. metal joining , brief process of gas welding **(3 hours)**

2.Demo of working of CNC machine **(2 hours)**
3.Fitting operations & power tools **(1 hour)**
4.Electric house wiring **(1 hour)**
5.Carpentry **(1 hour)**
6.Metal casting **(1hour)**
7.Welding (arc welding & gas welding), brazing **(1hour)**

(II) WORKSHOP PRACTICE: 60 hours

1. Machine shop **(12 hours) - on Lathe , Milling and drilling**
2. Fitting shop **(8 hours)**

3. Carpentry **(8 hours)**
4. Electrical house wiring **(8 hours)**
5. Welding shop **(8 hours (Arc welding 4 hrs + gas welding 4 hrs)**
6. Foundry practices – mould preparation **(8 hours)**
7. Smithy – Black smithy and Tin smithy **(8 hours)**

TEXT BOOKS :

1. HajraChoudhury S.K., HajraChoudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
2. Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology", 4th edition, Pearson Education India Edition, 2002.
3. Gowri P. Hariharan and A. Suresh Babu,"Manufacturing Technology – I" Pearson Education, 2008.

REFERENCES:

1. Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, Prentice Hall India, 1998.
2. Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.

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B.Tech : IT	**L**	**T-P-D**	**C**
I Year -II Semester	**3**	**1-0-0**	**4**

(F120A) MATHEMATICS-II
(ADVANCED CALCULUS)
(COMMON TO CE, EEE, ME, ECE, CSE, IT, ECM & MIE)

Course objectives:
At the end of the course, students will :

1. Geometrical approach to the mean value theorems and their application to the mathematical problems
2. Evaluation of improper integrals using Beta and Gamma functions.
3. Finding maxima and minima of function of two and three variables
4. Evaluation of multiple integrals and their applications
5. The physical quantities involved in engineering field related to vector valued functions
6. The basic properties of vector valued functions and their applications to line, surface and volume integrals

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

1. Solve the applications on the mean value theorems.
2. Evaluate the improper integrals using Beta and Gamma functions.
3. Find the extreme values of functions of two variables with/ without constraints.
4. Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelepiped.
5. Evaluate the line, surface and volume integrals and converting them from one to another

UNIT – I: CALCULUS: (10L)
Mean value theorems: Rolle's theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem. Taylor's Series.
Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves (Only in Cartesian coordinates), Definition of Improper Integral: Beta and Gamma functions and their applications.

UNIT – II: MULTIVARIABLE CALCULUS (PARTIAL DIFFERENTIATION AND APPLICATIONS): (8L)

Definitions of Limit and continuity. Partial Differentiation; Euler's Theorem; Total derivative; Jacobian; Functional dependence & independence, Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

UNIT – III: MULTIVARIABLE CALCULUS (INTEGRATION): (10L)

Evaluation of Double Integrals (Cartesian and polar coordinates); change of order of integration (only Cartesian form); Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals.

Applications: Areas (by double integrals) and volumes (by double integrals and triple integrals), Centre of mass and Gravity (constant and variable densities) by double and triple integrals (applications involving cubes, sphere and rectangular parallelopiped).

UNIT – IV : VECTOR DIFFERENTIATION: (10L)

Vector point functions and scalar point functions. Gradient, Divergence and Curl.

Directional derivatives, Tangent plane and normal line. Vector Identities. Scalar potential functions. Solenoidal and Irrotational vectors.

UNIT – V : VECTOR INTEGRATION: (10L)

Line, Surface and Volume Integrals.

Theorems of Green, Gauss and Stokes (without proofs) and their applications.

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006.
3. R.K.Jain& S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 4th Edition, 2014.

REFERENCES:

1. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, LaxmiPublications, Reprint, 2008.
2. G.B.Thomas and R.L.Finney, Calculus and Analytic Geometry, 9th Edition, Pearson, Reprint, 2010.

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B.Tech : IT	**L**	**T-P-D**	**C**
I Year -II Semester	**2**	**0-0-0**	**2**

(F120B) ENGLISH
(COMMON TO EEE, ME, ECE, CSE, IT & MIE)

Course objectives:
At the end of the course, students will :

1. To improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.
2. To equip students to study academic subjects more effectively and critically using the theoretical and practical components of English syllabus.
3. To develop study skills and communication skills in formal and informal situations.

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

1. To use English Language effectively in spoken and written forms.
2. To comprehend the given texts and respond appropriately.
3. To communicate confidently in various contexts and different cultures.
4. To acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.

UNIT –I:

'The Raman Effect' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary Building: The Concept of Word Formation --The Use of Prefixes and Suffixes.

Grammar: Identifying Common Errors in Writing with Reference to Articles and Prepositions.
Reading: Reading and Its Importance- Techniques for Effective Reading.

Basic Writing Skills: Sentence Structures -Use of Phrases and Clauses in Sentences- Importance of Proper Punctuation- Techniques for writing precisely – **Paragraph writing** – Types, Structures and Features of a Paragraph - Creating Coherence-Organizing Principles of Paragraphs in Documents.

UNIT – II:

'Ancient Architecture in India' from the prescribed textbook 'English for Engineers'

published by Cambridge University Press.
Vocabulary: Synonyms and Antonyms, Homophones, Homonyms, and Homographs.

Grammar: Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject-verb Agreement.

Reading: Improving Comprehension Skills – Techniques for Good Comprehension

Writing: Format of a Formal Letter-**Writing Formal Letters** E.g.., Letter of Complaint, Letter of Requisition, and Job Application with Resume.

UNIT – III :

'Blue Jeans' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Acquaintance with Prefixes and Suffixes from Foreign Languages in English to form Derivatives-Words from Foreign Languages and their Use in English.

Grammar: Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses.

Reading: Sub-skills of Reading- Skimming and Scanning

Writing: Nature and Style of Sensible Writing- **Defining- Describing** Objects, Places and Events – **Classifying**- Providing Examples or Evidence and Essay Writing

UNIT – IV:

'What Should You Be Eating' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Standard Abbreviations in English

Grammar: Redundancies and Clichés in Oral and Written Communication.

Reading: Comprehension- Intensive Reading and Extensive Reading
Writing: Writing Practices--Writing Introduction and Conclusion -Précis Writing.

UNIT – V :

'How a Chinese Billionaire Built Her Fortune' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Technical Vocabulary and their usage

Grammar: Common Errors in English

Reading: Reading Comprehension-Exercises for Practice

Writing: Technical Reports- Introduction – Characteristics of a Report – Categories of Reports

TEXT BOOKS:

1. Sudarshana, N.P. and Savitha, C. (2018). English for Engineers. Cambridge University Press.

REFERENCES:

1. Swan, M. (2016). Practical English Usage. Oxford University Press.
2. Kumar, S and Lata, P.(2018). Communication Skills. Oxford University Press.
3. Wood, F.T. (2007).Remedial English Grammar. Macmillan.
4. Zinsser, William. (2001). On Writing Well. Harper Resource Book.
5. Hamp-Lyons, L. (2006).Study Writing. Cambridge University Press.
6. Exercises in Spoken English. Parts I –III. CIEFL, Hyderabad. Oxford University Press.

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B.Tech : IT	**L**	**T-P-D**	**C**
I Year -II Semester	**3**	**0-0-0**	**3**

(F125A) PROGRAMMING FOR PROBLEM SOLVING
(COMMON TO CE, ME, CSE, IT & MIE)

Course objectives:
At the end of the course, students will :

1. To learn the fundamentals of computers.
2. To understand the various steps in program development.
3. To learn the syntax and semantics of C programming language.
4. To learn the usage of structured programming approach in solving problems.

Course outcomes:

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

1. To convert the algorithms/flowcharts to C programs.
2. To code and test a given logic in C programming language.
3. To decompose a problem into functions and to develop modular reusable code.
4. To use arrays, pointers, strings and structures to write C programs.
5. Searching and sorting problems.

UNIT – I:INTRODUCTION TO PROGRAMMING :

Introduction to components of a computer system: disks, primary and secondary emory, processor, operating system, compilers, creating, compiling and executing a program etc., Number systems.

Introduction to Algorithms: steps to solve logical and numerical problems. Representation of Algorithm, Flowchart/Pseudo code with examples, Program design and structured programming.

Introduction to C Programming Language: variables (with data types and space requirements), Syntax and Logical Errors in compilation, object and executable code , Operators, expressions and precedence, Expression evaluation, Storage classes (auto, extern, static and register), type conversion, The main method and command line arguments

Bitwise operations: Bitwise AND, OR, XOR and NOT operators Conditional Branching and Loops: Writing and evaluation of conditionals and consequent branching with if, if-else, switch-case, ternary operator, goto, Iteration with for, while, do- while loops. I/O: Simple

input and output with scanf and printf, formatted I/O, Introduction to stdin, stdout and stderr.

UNIT – II: ARRAYS, STRINGS, STRUCTURES AND PREPROCESSOR:

Arrays: one and two dimensional arrays, creating, accessing and manipulating elements of arrays.

Strings: Introduction to strings, handling strings as array of characters, basic string functions available in C (strlen, strcat, strcpy, strstr etc.), arrays of strings

Structures: Defining structures, initializing structures, unions, Array of structures
Preprocessor: Commonly used Preprocessor commands like include, define, undef, if, ifdef, ifndef.

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UNIT – III: POINTERS AND FILE HANDLING IN C:

Pointers: Idea of pointers, Defining pointers, Pointers to Arrays and Structures, Use of Pointers in self-referential structures, usage of self referential structures in linked list (no implementation) Enumeration data type.

Files: Text and Binary files, Creating and Reading and writing text and binary files, Appending data to existing files, Writing and reading structures using binary files, Random access using fseek, ftell and rewind functions.

UNIT – IV : FUNCTION AND DYNAMIC MEMORY ALLOCATION:

Functions: Designing structured programs, Declaring a function, Signature of a function, Parameters and return type of a function, passing parameters to functions, call by value, Passing arrays to functions, passing pointers to functions, idea of call by reference, Some C standard functions and libraries.

Recursion: Simple programs, such as Finding Factorial, Fibonacci series etc., Limitations of Recursive functions.

Dynamic memory allocation: Allocating and freeing memory, Allocating memory for arrays of different data types.

UNIT – V : INTRODUCTION TO ALGORITHMS:

Basic searching algorithms (linear and binary search techniques),

Basic sorting algorithms (Bubble, Insertion, Quick, Merge and Selection sort algorithms) Basic concept of order of complexity through the example programs

TEXT BOOKS:

1. ReemaThareja , Programming in C, Oxford university press.
2. B.A. Forouzan and R.F. Gilberg, C Programming and Data Structures, Cengage Learning, (3rdEdition)

REFERENCES:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
2. R.G. Dromey, How to solve it by Computer, Pearson (16thImpression)
3. Stephen G. Kochan, Programming in C, Fourth Edition, Pearson Education.
4. Herbert Schildt, C: The Complete Reference, McGraw Hill, 4thEdition
5. Byron Gottfried, Schaum's Outline of Programming with C,McGraw-Hill

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B.Tech : IT	**L**	**T-P-D**	**C**
I Year -II Semester	**3**	**1-0-0**	**4**

(F120D) ENGINEERING CHEMISTRY
(COMMON TO CE, ME, CSE, IT & MIE**)**

Course objectives:
At the end of the course, students will :

1. To bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer.
2. To include the importance of spectroscopic techniques and molecular energy levels.
3. To acquire knowledge of chemical reactions those are used in the synthesis of molecules.

Course outcomes:
At the end of the course, students will be able to:
The concepts developed in this course will aid in quantification of several concepts in chemistry that have been introduced at the 10+2 levels in schools. Technology is being increasingly based on the electronic, atomic and molecular level modifications. Quantum theory is more than 100 years old and to understand phenomena at nanometer levels; one has to base the description of all chemical processes at molecular levels. The course will enable the student to:

1. Students can rationalize bulk properties and processes using thermodynamic considerations.
2. Students can distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.
3. Students can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

UNIT – I: ATOMIC STRUCTURE AND THEORIES OF BONDING:
Atomic and Molecular orbitals. Linear Combination of Atomic Orbitals (LCAO), molecular orbitals of diatomic molecules, molecular orbital energy level diagrams of N_2, O_2, F_2, CO and NO.

Crystal Field Theory (CFT): Salient Features of CFT – Crystal Field Splitting of transition metal ion d- orbitals in Tetrahedral, Octahedral and square planar geometries. Band structure of solids and effect of doping on conductance.

UNIT – II: WATER AND ITS TREATMENT:
Introduction – hardness of water – Causes of hardness - Types of hardness: temporary and permanent – expression and units of hardness – Estimation of hardness of water by complex metric method. Potable water and its specifications. Steps involved in treatment of water – Disinfection of water by chlorination and ozonization.

Boiler feed water and its treatment – Calgon conditioning, Phosphate conditioning and Colloidal conditioning. External treatment of water – Ion exchange process. Desalination of water – Reverse osmosis. Numerical problems.

UNIT – III : ELECTROCHEMISTRY AND CORROSSION:

Electro chemical cells – electrode potential, standard electrode potential, types of electrodes – calomel, Quinhydrone and glass electrode. Nernst equation, determination of pH of a solution by using quinhydrone and glass electrode. Electrochemical series and its applications. Numerical problems. Batteries – Primary (Lithium cell) and secondary batteries (Lead – acid storage battery).

Corrossion: Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection – Sacrificial anode and impressed current cathodic methods. Surface coatings – metallic coatings – techniques of coating-hot dipping, cementation and electroplating of Copper.

UNIT – IV: SPECTROSCOPIC TECHNIQUES AND APPLICATIONS:

Principles of spectroscopy, selection rules and applications of electronic spectroscopy. Vibrational and rotational spectroscopy.

Basic concepts of Nuclear magnetic resonance Spectroscopy, chemical shift. Introduction to Magnetic resonance imaging.

UNIT – V: REACTION MECHANISM AND SYNTHESIS OF DRUG MOLECULES:

Substitution reactions: Nucleophilic substitution reactions: Mechanism of S_N1, S_N2 reactions. Electrophilic and nucleophilic addition reactions: Addition of HBr to propene. Markownikoff and anti Markownikoff's additions. Grignard additions on carbonyl compounds. Elimination reactions: Dehydro halogenation of alkylhalides. Saytzeff rule.

Oxidation reactions: Oxidation of alcohols using KMnO4 and chromic acid. Reduction reactions: reduction of carbonyl compounds using $LiAlH_4$& $NaBH_4$. Structure, synthesis and pharmaceutical applications of Paracetamol and Aspirin.

TEXT BOOKS:

1. Engineering Chemistry by P. C. Jain & M. Jain; DhanpatRai Publishing Company (P) Ltd., New Delhi.
2. Fundamentals of Molecular Spectroscopy, by C.N. Banwell
3. Organic Chemistry: Structure and Function by K.P.C. Volhardt and N. E. Schore, 5th Edition.
4. University Chemistry, by B.M. Mahan, Pearson IV Edition.
5. Physical Chemistry, by P.W. Atkins
6. Engineering Chemistry (NPTEL Web-book), by B.L. Tembe, Kamaluddin and M.S. Krishnan.

REFERENCES:

1. Engineering Chemistry(NPTEL web book) by B. L. Tembe, Kamaluddin and M.S.Krishnan
2. Stereochemistry of organic compounds by D.Narsipuri published by New age international publishers.

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B.Tech : IT	**L**	**T-P-D**	**C**
I Year -II Semester	**1**	**0-0-4**	**3**

(F123A) ENGINEERING DRAWING&COMPUTER GRAPHICS(Theory and Lab)
(COMMON TO CE, EEE, CSE, IT & ECM)

Pre-requisites: None

Course objectives:
At the end of the course, students will :

1. Learn a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
2. Prepare to communicate effectively.
3. Learn to use the techniques, skills, and modern engineering tools necessary for engineering practice.

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

1. Able to understand engineering drawing and its place in society
2. Exposed to the visual aspects of engineering drawing and graphics
3. Exposed to engineering graphics standards
4. Exposed to solid modeling
5. Exposed to computer-aided geometric design
6. Exposed to creating working drawings
7. Exposed to engineering communication

UNIT – I: INTRODUCTION TO ENGINEERING DRAWING (2 Lecture classes and 8 Practical's): Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering, Conic sections including the Rectangular Hyperbola (General method only);
Cycloid, Epicycloids, Hypocycloid and In volute.

UNIT – II: ORTHOGRAPHIC PROJECTIONS AND PROJECTIONS OF POINTS, LINES AND PLANES (2 Lecture classes and 12 Practical's): Principles of Orthographic Projections-Conventions - Projections of Points and lines inclined to both planes;

Projections of planes inclined to the Planes- Draw simple annotation, dimensioning and scale.

UNIT – III: PROJECTIONS OF REGULAR SOLIDS AND SECTIONAL VIEWS OF RIGHT REGULAR SOLIDS (2 Lecture Classes And 12 Practical's): Projections of regular solids - Prism, Cylinder, Pyramid, Cone – Auxiliary Views;

Draw the sectional views of geometrical solids.

UNIT – IV: ISOMETRIC AND ORTHOGRAPHIC PROJECTIONS(2 Lecture classes and 12 Practical's): Principles of Isometric projection – Isometric Scale, Isometric Views, Conversion of Isometric Views to Orthographic Views and Vice-versa.

UNIT – V: OVERVIEW OF COMPUTER GRAPHICS (2 Lecture classes and 16 Practical's): *Drafting Software*:Computer Aided Drafting (CAD) – Drafting Software – Manual Drafting vs Auto CAD Drafting. *Auto CAD commands*: Starting Auto CAD - Auto CAD commands – (Generation of Points, Lines, Curves and Polygons) - Editing and Modifications.
Drafting Settings - Dimensioning and Text - Geometrical Constructions. Projection of Points - Straight Lines - Plane surfaces – Solids - Isometric projections
Note: CAD Lab facility is required for this unit.
(Only theory Question to be set from this Unit for Examinations)

TEXT BOOKS :

1. Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House
2. K. Venugopal& V. Prabhu Raja (2011), Engineering Drawing + Auto CAD, New Age International Publishers. Fifth Edition.
3. CAD Software Theory and User Manuals

REFERENCES:

1. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers.
2. Agrawal B. &Agrawal C. M. (2012), Engineering Graphics, TMH Publication.

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B.Tech : IT	**L**	**T-P-D**	**C**
I Year -II Semester	**0**	**0-2-0**	**1**

(F1201) ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB
(COMMON TO EEE, ME, ECE, CSE, IT & MIE)

Course objectives:
At the end of the course, students will :

To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning

1. To sensitize students to the nuances of English speech sounds, word accent, intonation and rhythm
2. To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking
3. To improve the fluency of students in spoken English and neutralize their mother tongue influence
4. To train students to use language appropriately for public speaking and interviews

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

1. Better understanding of nuances of English language through audio- visual experience and group activities
2. Neutralization of accent for intelligibility
3. Speaking skills with clarity and confidence which in turn enhances their employability skills

The following course content is prescribed for the English for the English Language and Communication Skills Lab based on Unit -6 of AICTE Model Curriculum 2018 for B.Tech First English. As the syllabus is very limited, it is required to prepare teaching/learning materials by the teachers collectively in the form of handouts based on the needs of the students in their respective colleges for effective teaching/learning and timesaving in the lab.
SYLABUS:

English Language and Communication Sills Lab (ELCS) will have two parts:

a) **Computer Assisted Language Learning (CALL) Lab:**
b) **Interactive Communication Skills (ICS) Lab:**

Exercise – I:

CALL Lab:

Understand: Listening Skill- Its importance – Purpose- Process- Types- Barriers of Listening. ***Practice*:** Introduction to Phonetics – Speech Sounds – Vowels and Consonants.

ICS Lab: *Understand:* Communication at Work Place- Spoken vs. Written language. *Practice:* Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings – Taking Leave – Introducing Oneself and Others.

Exercise – II:

CALL Lab:

Understand: Structure of Syllables – Word Stress and Rhythm– Weak Forms and Strong Forms in Context.

Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms in Context.

ICS Lab:

Understand: Features of Good Conversation – Non-verbal Communication.

Practice: Situational Dialogues – Role-Play- Expressions in Various Situations –Making Requests and Seeking Permissions - Telephone Etiquette

Exercise – III:

CALL Lab:

Understand: Intonation-Errors in Pronunciation-the Influence of Mother Tongue (MTI).
Practice: Common Indian Variants in Pronunciation – Differences in British and American Pronunciation.

ICS Lab:

Understand: How to make Formal Presentations.

Practice: Formal Presentations.

Exercise – IV:

CALL Lab:

Understand: Listening for General Details.

Practice: Listening Comprehension Tests.

ICS Lab:

Understand: Public Speaking – Exposure to Structured Talks.

Practice: Making a Short Speech – Extempore.

Exercise – V:

CALL Lab:

Understand: Listening for Specific Details.

Practice: Listening Comprehension Tests.

ICS Lab:

Understand: Interview Skills.

Practice: Mock Interviews.

Computer Assisted Language Learning (CALL) Lab:

The Computer Assisted Language Learning Lab has to accommodate 40 students with 40 systems, with one Master Console, LAN facility and English language learning software for self-study by students. **System Requirement (Hardware component):** *Computer network with LAN facility (minimum 40 systems with multimedia) with the following specifications:*
i) Computers with Suitable Configuration
ii) High Fidelity Headphones

Interactive Communication Skills (ICS) Lab:

1. **The Interactive Communication Skills Lab:** A Spacious room with movable chairs and audio-visual aids with a Public-Address System, a LCD and a projector etc.

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B.Tech : IT	**L**	**T-P-D**	**C**
I Year -II Semester	**0**	**0-4-0**	**2**

(F1206) PROGRAMMING FOR PROBLEM SOLVING LAB

(COMMON TO CE, ME, CSE, IT & MIE)

Course objectives:

At the end of the course, students will :

1. To work with an IDE to create, edit, compile, run and debug programs
2. To analyze the various steps in program development.
3. To develop programs to solve basic problems by understanding basic concepts in C like operators, control statements etc.
4. To develop modular, reusable and readable C Programs using the concepts like functions, arrays etc.
5. To write programs using the Dynamic Memory Allocation concept.
6. To create, read from and write to text and binary files.

Course outcomes:

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

1. formulate the algorithms for simple problems
2. translate given algorithms to a working and correct program
3. correct syntax errors as reported by the compilers
4. identify and correct logical errors encountered during execution
5. represent and manipulate data with arrays, strings and structures
6. use pointers of different types
7. create, read and write to and from simple text and binary files
8. Modularize the code with functions so that they can be reused.

1. SIMPLE NUMERIC PROBLEMS:

a) Write a program for find the max and min from the three numbers.

b) Write the program for the simple, compound interest.

c) Write program that declares Class awarded for a given percentage of marks, where mark<40%= Failed, 40% to <60% = Second class, 60% to <70%=First class, >=70% = Distinction. Read percentage from standard input.

2. EXPRESSION EVALUATION:

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

b) Write a program that finds if a given number is a prime number

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

d) Write a C program to find the roots of a Quadraticequation.

3. ARRAYS AND POINTERS AND FUNCTIONS:

a) Write a C program to find the minimum, maximum and average in an array of integers.

b) Write a C program to find Addition of Two Matrices

c) Write a C program to find Multiplication of Two Matrices

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

e) Write a program for reading elements using pointer into array and display the values using array.

4.Files:

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

b) Write a C program which copies one file to another, replacing all lowercase characters

with their uppercase equivalents.

c) Write a C program to count the number of times a character occurs in a text file. The file name and the character are supplied as command line arguments.

5. Strings:

a) Write a C program to determine if the given string is a palindrome or not (Spelled same

in both directions with or without a meaning like madam, civic, noon, abcba, etc.)

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

6. Sorting and Searching:

a) Write a C program for using binary search method.

b) Write a C program for linear search.

c) Write a C program that implements the Bubble sort method.

d) Write a C program that implements the Insertion sort method.

e) Write a C program that implements the Quick sort method.

f) Write a C program that implements the Merge sort method.

ADDITIONAL PROGRAMS (Given to Students as Assignment):

1) Write a program that prints a multiplication table for a given number and the number of rows in the table. For example, for a number 5 and rows = 3, the output should be:
   a. 5 x 1 = 5
   b. 5 x 2 =10
   c. 5 x 3 =15
2) Write a program that shows the binary equivalent of a given positive number between 0 to255.

3) Write a C program to find the sum of individual digits of a positive integer and test given
Number is palindrome.
4) Write a C program to generate all the prime numbers between 1 and n, where n is a value
supplied by the user.
5) Write a C program to calculate the following, where x is a fractional value. 1-x/2+x^2/4-x^3/6.
6) Write a C program to read in two numbers, x and n, and then compute the sum of this Geometric progression:1+x+x^2+x^3+ .....+x^n. For example: if n is3 and x is 5, then the program computes 1+5+25+125.
7) Write a C program to find the minimum, maximum and average in an array of integers.
8) Write a functions to compute mean, variance, Standard Deviation, sorting of n elements in single dimension array.
9) Write a C program that uses functions to perform the following:

(a) Transpose of a matrix with memory dynamically allocated for the new matrix as row and column counts may not be same.
(b) To find the factorial of a given integer.
(c) To find the GCD (greatest common divisor) of two given integers.

10) Write a C program that does the following:

(a) It should first create a binary file and store 10 integers, where the file name and 10 values are given in the command line. (hint: convert the strings using atoi function) Now the program asks for an index and a value from the user and the value at that index should be changed to the new value in the file. (hint: use fseek function). The program should then read all 10 values and print them back.

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

11) Write a C program to convert a Roman numeral ranging from I to L to its decimal equivalent.

12) Write a C program that converts a number ranging from 1 to 50 to Roman equivalent

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

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

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

14) Write a C program to construct a pyramid of numbers as follows:

```
1          *          1          1        *
1 2        * *        2 3        2 2        * *
1 2 3      * * *      4 5 6      3 3 3        * * *
                                 4 4 4 4    * *
                                              *
```

15) Write a C program that sorts a given array of names.

Suggested Reference Books for solving the problems:

1. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)
2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
3. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression)
4. Stephen G. Kochan,Programming in C, Fourth Edition, Pearson Education.
5. Herbert Schildt, C: The Complete Reference, McGrawHill, 4th Edition
6. Byron Gottfried, Schaum'sOutline of Programming with C,McGraw-Hill.

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B.Tech : IT	**L**	**T-P-D**	**C**
I Year -II Semester	**0**	**0-3-0**	**1.5**

(F1203) CHEMISTRY LABORATORY
(Common To CE, ME, CSE, IT & MIE)

Course objectives:
At the end of the course, students will :
The course consists of experiments related to the principles of chemistry required for engineering student. The student will learn:

1. Estimation of hardness and chloride content in water to check its suitability for drinking purpose.
2. To determine the rate constant of reactions from concentrations as a function of time.
3. The measurement of physical properties like adsorption and viscosity.
4. To synthesize the drug molecules and check the purity of organic molecules by thin layer chromatographic (TLC) technique.

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

1. Determination of parameters like hardness and chloride content in water.
2. Estimation of rate constant of a reaction from concentration – time relationships.
3. Determination of physical properties like adsorption and viscosity.
4. Calculation of R_f values of some organic molecules by TLC technique.

1. Determination of total hardness of water by complexometric method using EDTA
2. Determination of chloride content of water by Argentometry
3. Estimation of an HCl by Conductometric titrations
4. Estimation of Acetic acid by Conductometric titrations
5. Estimation of HCl by Potentiometric titrations
6. Estimation of Fe^{2+} by Potentiometry using KMnO4
7. Estimation of amount of Cu^{+2} by Colorimetry
8. Estimation of amount of $KMnO_4$ by Colorimetry
9. Synthesis of Aspirin and Paracetamol
10. Determination of acid value of coconut oil
11. Thin layer chromatography calculation of R_f values. egortho and para nitro phenols
12. Determination of viscosity of castor oil and ground nut oil by using Ostwald's viscometer.
13. Determination of partition coefficient of acetic acid between n- butanol and water.
14. Determination of surface tension of a give liquid using stalagmometer.

REFERENCES:

1. B.D. Khosla, A. Gulati and V. Garg ,Senior practical physical chemistry, B (R. Chand & Co., Delhi)
2. K.K. Sharma and D. S. Sharma , An introduction to practical chemistry, (Vikas publishing, N. Delhi)
3. Vogel's text book of practical organic chemistry 5th edition
4. Text book on Experiments and calculations in engineering chemistry – S.S. Dara

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B.Tech : IT	L	T	P	D	C
II Year -I Semester	3	0	0	0	3

(F215A) DATA STRUCTURES

(Common to CSE, IT & ECM)

Course objectives:

At the end of the course, students will :

1. Define the basic data structures like linked list.
2. Understand the fundamentals and applications of linked list, stacks and queues.
3. Classify different types of tree data structures
4. Understand the concepts of graph data structures.
5. Know the fundamentals of basic searching, sorting and pattern matching algorithms.

Course outcomes:

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

1. Demonstrate operations like searching, insertion, deletion, traversing mechanism using linked list.
2. Use linear and non-linear data structures like stacks, queues etc.
3. Implement different types of tree data structures.
4. Implement the concepts of graph data structures.
5. Apply the basic searching, sorting and pattern matching Techniques.

UNIT - I:

Basic concepts - Algorithm Specification, Data Abstraction , Performance analysis - time complexity and space complexity, Asymptotic Notation - Big O, Omega and Theta notations, Introduction to Linear and Non Linear data structures.

Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, circular linked list implementation, Doubly linked list implementation, insertion, deletion and searching operations. Applications of linked lists.

UNIT - II:

Stacks-Operations, array and linked representations of stacks, stack applications-infix to postfix conversion, postfix expression evaluation, recursion implementation.

Queues-operations, array and linked representations. Circular Queue operations, Dequeue, applications of queue.

UNIT - III:

Trees – Terminology, Representation of Trees, Binary tree ADT, Properties of Binary Trees, Binary Tree Representations-array and linked representations, Binary Tree traversals, Threaded binary trees, Binary Heap-Properties, Max and Min Heap, Operations-Insertion and Deletion.

Search Trees-Binary Search tree, Tree traversals, AVL tree – operations, B-tree – operations, B+ trees, Red Black tree.

UNIT - IV:

Graphs-Terminology, sequential and linked representation, graph traversals : Depth First Search & Breadth First Search implementation. Spanning trees, Prims and Kruskals method.

Searching and Sorting - Linear Search, Binary Search, Insertion Sort, Selection Sort, Merge Sort, Quick sort, Heap Sort.

UNIT - V:

Hashing-Hash table, Hash table representations, hash functions, collision resolution techniques-separate chaining, open addressing-linear probing, quadratic probing, double hashing, Re hashing, Extendible hashing,

Pattern matching : Introduction, Brute force, the Boyer –Moore algorithm, Knuth-Morris-Pratt algorithm.

Textbooks:

1. Data Structures Using C, Reema Thareja, Oxford University Press, 2011 Learning.
2. Introduction to Algorithms, TH Cormen, PHI

References:

1. Data Structures & Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education.
2. Design methods and analysis of Algorithms, SK Basu, PHI.
3. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, Universities Press.

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B.Tech : IT	L	T-P-D	C
II Year -I Semester	3	0-0-0	3

(F215B) OPERATING SYSTEMS

(Common to CSE & IT)

Course objectives:

At the end of the course, students will :

1. Know the basic concepts related to operating systems and learn in detail about process management.
2. Describe concurrency control of processes like critical-section problems and its solution and understand memory management functions of operating systems.
3. Understand principles of deadlock and the concepts of file system interface.
4. Explain various file system implementation and mass storage management functions of operating systems.
5. Understand Protection and security aspects of operating systems and is also exposed to the advanced operating systems.

Course outcomes:

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

1. Contrast and compare differing structures for operating systems including process management.
2. Apply different CPU scheduling algorithms and various Memory management techniques.
3. Illustrate the use of Bankers algorithm for deadlock avoidance and File system organization.
4. Demonstrate various mass storage management techniques.
5. Analyze different aspects of protection and security concepts.

UNIT - I:

Operating System Overview:

Overview of Computer Operating Systems, Operating System Functions, Protection and Security, Distributed Systems, Special Purpose Systems, Operating System Structures, Operating System Services and Systems Calls, Operating Systems Generation.

Process Management:

Process Concepts, Threads, Scheduling-Criteria, Algorithms Evaluation, Thread Scheduling.

UNIT - II:

Concurrency:

Process Synchronization, Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization examples, Atomic Transactions.

Memory Management:

Swapping, Contiguous Memory Allocation, Paging, Page-Table Structure, Segmentation, Virtual Memory, Demand Paging, Page-Replacement Algorithms, Frames Allocation, Thrashing.

UNIT - III:

Principles of Deadlock:

System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery from Deadlock.

File System:

File System Interface, File Concepts, Access Methods and Directory Structure, File System Mounting, File Sharing and Protection.

UNIT - IV:

File System Implementation:

File System Structure, File System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance. Case Studies: UNIX, Linux and Windows.

Mass Storage Overview:

Mass-Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Swap-Space Management, RAID Structure, Stable-Storage Implementation, Tertiary Storage Structure.

UNIT - V:

Protection & Security:

Goals of Protection, Principles of Protection, Domain of Protection Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection. Security Problem, Program Threats, System and Network Threats Cryptography as a Security Tool, User Authentication, Implementing Security Defenses, Firewalling to protect Systems and Networks, Computer-Security Classifications, Case Studies: UNIX, Linux and Windows.

Advanced Operating Systems:

Distributed Operating Systems, Multi-Processor Operating Systems, Real-Time Operating Systems and Mobile Operating Systems.

TEXT BOOKS:

1. **Operating System Concepts-Abraham Silberchatz**, Peter B. Galvin, Greg Gagne, 7th Edition, John Wiley.
2. **Operating Systems- A Concept based Approach**-D.M.Dhamdhere, 2nd Edition, TMH.

REFERENCE BOOKS:

1. **Principles of Operating Systems-Naresh Chauhan,** Oxford Higher Education.
2. **Operating System A Design Approach**-Crowley, TMH.
3. **Modern Operating Systems**-Andrew S Tanenbaum, 2nd Edition Pearson, PHI.

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B.Tech : IT	L	T-P-D	C
II Year - I Semester	3	0-0-0	3

(F216A) DATABASE MANAGEMENT SYSTEMS

(Common to CSE & IT)

Course objectives:

At the end of the course, students will :

1. Understanding of the architecture and functioning of database management systems as well as associated tools and techniques.
2. Understand and apply the principles of data modeling using entity relationship and develop a good database design.
3. Understand the use of structured query language (SQL) and its syntax.
4. Apply normalization techniques to normalize a database.
5. Understand the need of database processing and learn techniques for controlling the consequences of concurrent data access.

Course outcomes:

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

1. Describe basic concepts of database system.
2. Design a data model and schemas in RDBMS.
3. Use RDBMS for developing industry applications.
4. Be competent in use of structured query language Sql.
5. Analyze functional dependencies for designing a robust database

UNIT - I:

Data base Systems- Data base System Applications, data base System VS file System – View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor

ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model

UNIT - II:

Introduction to the Relational Model

-Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.

Relational Algebra

-Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

UNIT - III:

Form of Basic SQL Query

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

Schema refinement

-Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form.

UNIT - IV:

Transaction Concept

Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability– Implementation of Isolation – Testing for serializability- Lock – Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity.

Recovery and Atomicity

-Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems.

UNIT - V:

Data on External Storage

-File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning- Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

Advanced Database Management System

Introduction to Distributed Database-Reference Architecture, fragmentation, Allocation, Joins

Text Books:

1. **Data Base Management Systems**, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
2. **Data base System Concepts**, Silberschatz, Korth, McGraw hill, V edition.

Reference Books:

1. **Data base Systems design,** Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. **Fundamentals of Database Systems,** Elmasri Navrate Pearson Education
3. **Introduction to Database Systems,** C.J.Date Pearson Education

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B.Tech : IT	**L**	**T-P-D**	**C**
II Year – I Semester	**3**	**0-0-0**	**3**

(F210E) PROFESSIONAL ETHICS

(Common to ECE, CSE, IT, ECM, EEE)

Course objectives:

At the end of the course, students will :

This introductory course input is intended to help the students in understanding of ethics, values and holistic approach towards ethical living.

Course outcomes:

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

1. It ensures students in understanding essentials of human values and ethical living through basic ethical and moral theories.
2. Having awareness on professionalism, professional responsibilities, professional etiquettes.
3. It helps in understanding of ethical codes and audit.
4. Laying strong foundations in human values through domains of learning, ethical living through case studies.
5. Ability to develop various solutions in solving of global issues and for its safety and sustainability.

UNIT - I:Introduction to Ethics

Corporate Governance – importance of Corporate Governance, Ethics & CSR(Corporate Social Responsibility)……..Indian and western thoughts on ethics.

Value education, dimensions of ethics, goal setting importance of morality and ethics, basic ethical principles, moral developments theories, classification of ethical theories.

UNIT - II: Professional and professionalism

Introduction to profession, professional associations, professional's roles and professional risks. Professional accountability, successful professional, ethics and profession.

Engineering as social experimentation, engineering ethics, roles of engineers, professional responsibilities, professional rights. Professional etiquettes- Dress code, Telephone call, Email writing.

UNIT - III: Ethical codes and audits

Introduction, need for ethical codes, sample codes, corporate codes, limitations of the codes.

Need for Ethical Audit, Sustainability, Ethical standards, Ethical audit.

UNIT-IV : Human values and ethical living

Introduction, terminology, domains of learning, human values, attitudes, Behaviour values, attitudes and professionals.

Needs of life, harmony in life, what is ethical living, case studies.

UNIT-V: Global issues and safety

Introduction, current scenario, business ethics, environmental ethics, computer ethics, media ethics, war ethics, bio-ethics, research ethics, intellectual property right.

Safety and risk, assessment of risk, risk and cost, engineers responsibility for safety, risk benefit, analysis, risk cause and management, case studies, providing for safe exit, ethical issues of safety.

REFERENCES:

1. Professional ethics by R. Subramanian, Oxford press.
2. Text book on Professional ethics and human values by R.S.Nagarajan, New age international.
3. Professional ethics and human value by D.R.Kiran, Tata McGraw Hills education.
4. Ethics in engineering by Mike W. Martin and Roland Schinzinger, Tata McGraw Hills education.
5. Fundamental of Ethics by Edmund G Seebauer and Robert L.Barry, Oxford university press.

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B.Tech : IT	**L**	**T-P-D**	**C**
II Year - I Semester	**3**	**1-0-0**	**4**

(F210B) PROBABILITY AND STATISTICS

(Common to CSE & IT)

Course objectives:

At the end of the course, students will :

1. Basic properties of probability and random variables
2. Types of hypothesis and hypothesis testing
3. The t-distribution, f-distribution and chi-square distribution.
4. Relationship between the variables and fitting of curve to the given data
5. The queuing models and characteristics

Course outcomes:

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

1. Classify the types of random variables and calculate mean and variance
2. Recognize where the binomial distribution could be appropriate model and find mean and variance
3. Understand the foundation for classical inference involving confidence interval and hypothesis testing
4. Calculate the correlation and regression to the given data
5. Describe the queuing system, mean arrival and service rates

UNIT-I :

PROBABILITY

Random variables-Definitions of Random variables (Discrete and continuous).Distributions-Binomial, Poisson and normal distributions.

Related properties-Sampling distributions –Sampling distribution of means (σ known and Unknown)

UNIT-II:

TESTING OF HYPOTHESIS

Tests of hypothesis point estimations – interval estimations-Large samples-Null hypothesis – Alternate hypothesis-type I & type II- errors – critical region.

Confidence interval for mean testing of single variance-Difference between the means.

UNIT-III:

SMALL SAMPLES

Confidence interval for the t- distribution – Tests of hypothesis- t- distribution.

F- distribution, χ^2 distribution- Test of Hypothesis.

UNIT-IV:

CORRELATION & REGRESSION:

Coefficient of correlation – Regression Coefficient – The lines of regression – The rank correlation

CURVE FITTING:

Fitting of straight line -second degree curve- exponential curve-power curve by method of Least squares

UNIT-V:

QUEUING THEORY:

Queue description, characteristics of a queuing model, Poisson process, concept of Birth and death process.

Steady state solutions of (M/M/1: ∞ /FIFO) and (M/M/1: N/FIFO) (Concepts and problem solving).

TEXT BOOKS:

1. Grewal B.S, "Higher Engineering Mathematics", Khanna publications, 42nd edition 2012
2. Engineering Mathematics by B.V.Ramana, Tata McGrawhill Publishing company Ltd New Delhi, 5th edition, 2011

REFERENCES:

1. Probability and Statistics by G.Shankar Rao, I.K.International Publications.
2. KREYSZIG. E, "Advanced Engineering Mathematics" JohnWiley & Sons Singapore, 10th edition, 2012.
3. Veerarajan.T " Engineering Mathematics-I", Tata McGrawhill Publishing Co.New Delhi, 5th edition, 2006.

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B.Tech : IT	**L**	**T-P-D**	**C**
II Year - I Semester	**2**	**0-0-0**	**0**

(F210C) GENDER SENSITIZATION

(Common to all branches)

Course objectives:

At the end of the course, students will :

1. Understand Caste System
2. Learn women's work its politics and economics aware rebuilding lives
3. Understand about relationships, responsibilities and gender identities

Course outcomes:

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

1. Describes the basic structure of Caste system in India and the major four categories to which all castes could be Come out of ignorance and archaic indoctrination to make the world a better place for both men and women.
2. Have learnt to keep them safe and alive in the face of domestic violence.
3. Learnt to maintain equality in gender. The student should have understood the responsibility of being good Citizens overcoming social evils
4. Describes the basic structure of Caste system in India and the major four categories to which all castes could be

Unit-I – Gender: Why should we study it? Socialization: Making women, Making Men.

Introduction, Preparing For Womanhood, Growing up male, First lessons in caste, Different masculinities.

Unit-II- Women's Work: Its Politics and Economics

Fact and fiction, Unrecognized and unaccounted work, Further reading: Wages and conditions of work.

Domestic Violence: Speaking Out, Is home a safe place?, When women unite [Film], Rebuilding lives, Further reading: New forums for justice.

Unit-III–Just Relationships: Being Together as Equals

Mary kom and Onler, Love and acid just do not mix, Love letters.

Mothers and fathers, Further Reading: Rosa Parks – The brave heart.

Text Books:

1. Towards a world of equals by A.Suneetha SusicTharu publication Telugu academy Hyderabad

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B.Tech : IT	**L**	**T-P-D**	**C**
II Year - I Semester	**0**	**0-4-0**	**2**

(F2161) DATABASE MANAGEMENT SYSTEMS LAB

(Common to CSE & IT)

Course objectives:

At the end of the course, students will :

1. Familiarize with the nuances of database environments towards an information- oriented data-processing oriented framework.
2. Gain a good formal foundation on the relational model of data present sql and procedural interfaces to sql comprehensively.
3. Gain an introduction to systematic database design approaches covering conceptual design, logical design and an overview of physical design and to motivate the students to relate all these to one or more commercial product environments as they relate to the developer tasks.
4. Present the concepts and techniques relating to query processing by sql engines and present the concepts and techniques relating to ODBC and its implementations.
5. Introduce the concepts of transactions and transaction processing and to present the issues and techniques relating to concurrency and recovery in multi-user database environments.

Course outcomes:

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

1. Understand, appreciate and effectively explain the underlying concepts of database technologies
2. Design and implement a database schema for a given problem-domain
3. Normalize a database.
4. Populate and query a database using SQL DML/DDL commands.
5. Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS

This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database for an example company named "Roadway Travels" whose description is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database "Roadway travels". Students are expected to use "Oracle" database. Roadway Travels "Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.
The company wants to computerize its operations in the following areas:

- Reservations and Ticketing
- Cancellations Reservations & Cancellation: Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One Passenger/person can book many tickets (to his/her family). Cancellations are also directly handed at the booking office. In the process of computerization of Roadway Travels you

have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from the database.

The above process involves many steps like

1. Analyzing the problem and identifying the Entities and Relationships
2. E-R Model
3. Relational Model
4. Normalization
5. Creating the database
6. Querying. Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels.

Examples are given at every experiment for guidance to students.

Experiment – 1.

E-R Model

Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc.

Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any

Example: Entities:

1. BUS
2. Ticket
3. Passenger

Relationships:

1. Reservation
2. Cancellation

PRIMARY KEY ATTRIBUTES:

1. Ticket ID (Ticket Entity)
2. Passport ID (Passenger Entity)
3. Bus_NO(Bus Entity)

Apart from the above mentioned entities you can identify more. The above mentioned are few.

Note:

The student is required to submit a document by writing the Entities and Keys to the lab teacher.

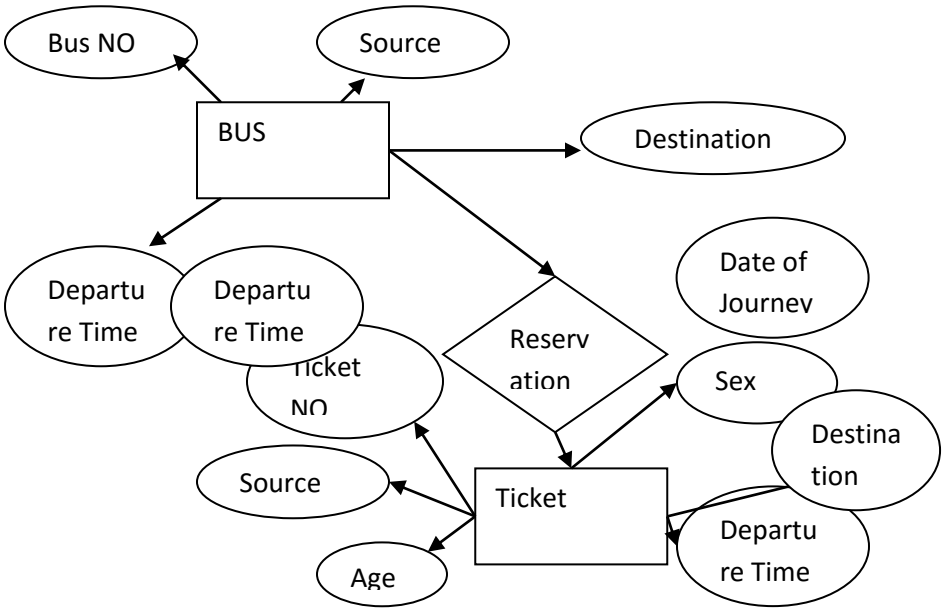
Experiment – 2.

Concept design with E-R Model

Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total / partial). Try to incorporate

generalization, aggregation, specialization etc wherever required.

Example:
E-R diagram for bus



Note: The student is required to submit a document by drawing the E-R Diagram to the lab teacher.

Experiment – 3.

Relational Model
Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the cardinality. Represent attributes as columns in tables or as tables based on the requirement. Different types of attributes (Composite, Multi-valued, and Derived) have different way of representation.

Example:
The passenger tables look as below. This is an example. You can add more attributes based on your E-R model. This is not a normalized table.
Passenger

Name	Age	Sex	Address	Passport ID
			Ticket_id	

Note:
The student is required to submit a document by Represent relationships in a tabular fashion to the lab teacher.

Experiment – 4.
Normalization
Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.
For the above table in the First normalization we can remove the multi valued attribute Ticket_id and place it in another table along with the primary key of passenger.

First Normal Form: The above table can be divided into two tables as shown below.
Passenger

Name	Age	Sex	Address	Passport ID

Passport ID	Ticket_id

You can do the second and third normal forms if required. Any how Normalized tables are given at the end.

Experiment - 5.
Installation of Mysql and Practicing DDL and DML commands
Installation of MySql. In this week you will learn Creating databases, How to create tables, altering the database, dropping tables and databases if not required. You will also try truncate, rename commands etc.

Example for creation of a normalized "Passenger" table.

```
CREATE TABLE Passenger (Passport_id     INTEGER   PRIMARY KEY,
   Name  VARCHAR (50) Not NULL,
   Age     Integer Not NULL,
   Sex     Char,
   Address VARCHAR (50) Not NULL);
```

Similarly create all other tables.

Note: Detailed creation of tables is given at the end.
Insert data into the above tables.

DML commands are used to for managing data within schema objects. Some examples:

- SELECT - retrieve data from the a database
- INSERT - insert data into a table
- UPDATE - updates existing data within a table
- DELETE - deletes all records from a table, the space for the records remain

Inserting values into "Bus" table

```
Insert into Bus values (1234,'hyderabad', 'tirupathi');
Insert into Bus values (2345,'hyderabd','Banglore');
Insert into Bus values (23,'hyderabd','Kolkata');
Insert into Bus values (45,'Tirupathi,'Banglore');
Insert into Bus values (34,'hyderabd','Chennai');
```

Inserting values into "Passenger" table:

```
Insert into Passenger values (1, 45,'ramesh', 45,'M','abc123');
Insert into Passenger values (2, 78,'geetha', 36,'F','abc124');
Insert into Passenger values (45, 90,'ram', 30,'M','abc12');
Insert into Passenger values (67, 89,'ravi', 50,'M','abc14');
Insert into Passenger values (56, 22,'seetha', 32,'F','abc55');
```

Few more Examples of DML commands

```
Select * from Bus; (selects all the attributes and display)
UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;
```

Experiment 6. Querying

In this week you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

Practice the following Queries:

1. Display unique PNR_no of all passengers.
2. Display all the names of male passengers.
3. Display the ticket numbers and names of all the passengers.
4. Find the ticket numbers of the passengers whose name start with 'r' and ends with 'h'.
5. Find the names of passengers whose age is between 30 and 45.
6. Display all the passengers names beginning with 'A'
7. Display the sorted list of passengers names

Experiment – 7. Querying (continued...)

You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN),

GROUP BY, HAVING and Creation and dropping of Views.

1. Write a Query to display the Information present in the Passenger and cancellation tables. **Hint:** Use UNION Operator.
2. Display the number of days in a week on which the 9W01 bus is available.
3. Find number of tickets booked for each PNR_no using GROUP BY CLAUSE. **Hint:** Use GROUP BY on PNR_No.
4. Find the distinct PNR numbers that are present.
5. Find the number of tickets booked by a passenger where the number of seats is greater than 1.
   Hint: Use GROUP BY, WHERE and HAVING CLAUSES.
6. Find the total number of cancelled seats.
7. Display the details of passengers who travelled within the last 3 months.
8. Create a view for the details of passengers who cancelled their tickets.

Experiment – 8.

Create tables for the following schema. Student(snum: integer, sname: string, major: string, level: string, age: integer) Class(name: string, meets at: time, room: string, fid: integer) Enrolled(snum: integer, cname: string) Faculty(fid: integer, fname: string, deptid: integer)

Experiment – 9. Querying

1. Find the names of all Juniors (Level = JR) who are enrolled in a class taught by I. Teacher.
2. Find the age of the oldest student who is either a History major or is enrolled in a course taught by I. Teacher.
3. Find the names of all classes that either meet in room R128 or have 5 or more students enrolled.
4. Find the names of all students who are enrolled in two classes that meet at the same time.

5. Find the names of faculty members who teach in every room in which some class is taught.
6. Find the names of faculty members for whom the combined enrollment of the courses that they teach is less than 5
7. Print the Level and the average age of students for that Level, for each Level.
8. Print the Level and the average age of students for that Level, for all Levels except JR. 9
9. Print the Level and the average age of students for that Level, whose average age is greater than 20.
10. Find the names of students who are enrolled in the maximum number of classes.
11. Find the names of students who are not enrolled in any class.
12. Count the number of junior level students.
13. Display all the students whose names starts with the letter "p".
14. Display all the teachers whose names contain letter 'a' or 'I' in their names.

Experiment – 10. Procedures

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

Eg: CREATE PROCEDURE myProc()
BEGIN
SELECT COUNT(Tickets) FROM Ticket WHERE age>=40;
End;

Text Books:

1. **Introduction to SQL**,Rick F.Vander Lans,Pearson education.

Reference Books:

1. **Oracle PL/SQL Programming**,Steven Feuerstein,SPD.
2. **SQL & PL/SQL** for Oracle 10g,Black Book, Dr.P.S.Deshpande,Dream Tech.

Oracle Database ll g PL/SQL Programming,M.Laughlin.TMH.

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	L	T-P-D	C
B.Tech : IT			
II Year - I Semester	**0**	**0-3-0**	**1.5**

(F2151) DATA STRUCTURES LAB

(Common to CSE, IT & ECM)

Course objectives:

At the end of the course, students will :

1. Define the basic data structures like linked list.
2. Understand the fundamentals and applications of linked list, stacks and queues.
3. Classify different types of tree data structures
4. Understand the concepts of graph data structures.
5. Know the fundamentals of basic searching, sorting and pattern matching algorithms.

Course outcomes:

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

1. Demonstrate operations like searching, insertion, deletion, traversing mechanism using linked list.
2. Use linear and non-linear data structures like stacks, queues etc.
3. Implement different types of tree data structures.
4. Implement the concepts of graph data structures.
5. Apply the basic searching, sorting and pattern matching Techniques.

Experiment 1:

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

I) Creation II) Insertion III) Deletion IV) Traversal V) merge two single linked lists

Experiment 2:

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

I) Creation II) Insertion III) Deletion IV) Traversal

Experiment 3:

Write a C program that implement stack operations using

I) Arrays II) Linked Lists

Experiment 4:

I) Write a C program to convert infix expression to postfix expression using stack

II) Write a C program to evaluate postfix expression

Experiment 5:

I) Programs using recursion

II)Write a C program to convert infix expression to prefix expression using stack

Experiment 6:

Write a C program to implement Linear queue using

I) Arrays II) Linked Lists

Experiment 7:

Write a C program to perform following operations on a circular Queue

I) insertion II) deletion III) search and count

Experiment 8:
Write a C program to perform following operations on a circular DeQueue
I)insertion II) deletion III) search and count

Experiment 9:
I) Write a C Program to implement binary tree traversals
II) Write a C Program to implement AVL tree operations

Experiment 10:
I) Implementation of a Graph representation using Adjacency Matrix
II) Write a C program to implement graph traversals.

Experiment 11:
I)Write a C program to implement Linear search
II) Write a C program to implement Binary Search

Experiment 12:
Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
I) Bubble sort II) Selection sort III) Insertion Sort

Experiment 13:
Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
I) Merge sort II) Quick sort

Experiment 14:
I)Write a C Program to Implement the Hashing technique
II)Write a C Program to Implement the KMP Pattern Searching Algorithm

Text Books:

1. **C Programming & Data Structures**, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. **Data Structures Using C** (Paperback) by Aaron M. Tenenbaum

Reference Books:

1. **C& Data structures** – P. Padmanabham, Third Edition, B.S. Publications.
2. **Data Structures using C** – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education / PHI
3. **C Programming & Data Structures**, E. Balagurusamy, TMH.

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B.Tech : IT	L	T-P-D	C
II Year -I Semester	0	0-3-0	1.5

(F2152) OPERATING SYSTEMS LAB

(Common to CSE & IT)

Course objectives:

At the end of the course, students will :

1. Describe CPU scheduling algorithms.
2. Understand the file allocation and file organization strategies.
3. Understand banker's algorithm for deadlock prevention and avoidance.
4. Explain various memory management and page replacement algorithms.
5. Discuss paging and allocation of frames.

Course outcomes:

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

1. Apply different CPU scheduling algorithms.
2. Implement different directory structures.
3. Analyze deadlock prevention and avoidance algorithms.
4. Demonstrate various page replacement algorithms.
5. Practice various disk scheduling algorithms.

Experiment 1: Simulate the following CPU scheduling algorithms

a) FCFS

b) SJF

Experiment 2: Simulate the following CPU Scheduling algorithms

a) Round Robin

b) Prioriy

Experiment 3: Simulate all file allocation strategies

a) Sequential

b) Linked

c) Indexed

Experiment 4: Simulate MVT and MFT.

Experiment 5: Simulate the following File Organization Techniques

a) Single level directory

b) Two level directory

Experiment 6: Simulate the Hierarchical File Organization Technique

Experiment 7: Simulate the following Disk scheduling algorithms

a) FCFS

b) SSTF

c) SCAN

d) C-SCAN

Experiment 8: Simulate Bankers Algorithm for Dead Lock Avoidance**.**

Experiment 9: Simulate Bankers Algorithm for Dead Lock Prevention.

Experiment 10: Simulate all page replacement algorithms

a) FIFO

b) LRU

c) LFU

Experiment 11: Simulate Paging Technique of memory management.

Experiment 12: Simulate on Allocation of Frames.

REFERENCE BOOKS:

1. Operating System Concepts-Abraham Silberchatz, Peter B. Galvin, Greg Gagne, 7th Edition, John Wiley.
2. Operating Systems- A Concept based Approach- D.M.Dhamdhere, 2nd Edition, TMH.
3. Principles of Operating Systems- Naresh Chauhan, Oxford Higher Education.
4. Operating System A Design Approach-Crowley, TMH.
5. Modern Operating Systems-Andrew S Tanenbaum, 2nd Edition Pearson, PHI.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year II- Semester	**3**	**0-0-0**	**3**

(F225A) OBJECT ORIENTED PROGRAMMING THROUGH JAVA

(Common to CSE, IT & ECM)

Course objectives:

At the end of the course, students will :

1. Familiar with constructors and string handling functions
2. Explain inheritance and polymorphism
3. Familiar with packages and interfaces
4. Familiar with exception handling and multithreading
5. Familiar with applet programming, event handling and scripting.

Course outcomes:

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

1. Familiar with constructors and string handling
2. Understand inheritance and polymorphism
3. Understand packages and interfaces
4. Understand exception handling and multithreading
5. Understand applet programming

UNIT – I:

Introduction: OOP concepts, history of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program.

Classes and Objects: concepts of classes, objects, constructors, methods, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion.
String handling: String, String Buffer, String Tokenize.

UNIT – II:

Inheritance: base class object, subclass, member access rules, super uses, using final with inheritance, method overriding, abstract classes
Interfaces: defining an interface, implementing interface, differences between classes and interfaces and extending interfaces.

Packages: Defining, creating and accessing a package, importing packages, access control, exploring package - java.io

UNIT – III:

Exception handling: concepts of exception handling, benefits of exception handling, exception hierarchy, checked and unchecked exceptions, usage of-try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.
Multithreading: differences between multi-threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

UNIT – IV:

Applets: concepts of applets, differences between applets and applications, life cycle of applet, types of applets, creating applets, passing parameters to applets.

Event Handling: events, event sources, event classes, event listeners, delegation event model, handling mouse and key board events, adapter classes. The AWT class hierarchy, user interface components-labels, buttons, canvas, scrollbars, text components, checkbox, checkbox groups, choices, lists

UNIT – V:

Layout manager: layout manager types-border, grid, flow, card and grid bag.
Swing: Introduction, limitations of AWT, components, containers,
Exploring swing- JApplet, JFrame and JComponent, Icons and Labels, Text fields, buttons – The JButton class, Checkboxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees and Tables.

TEXT BOOKS:

1. Java The complete reference, 8th editon, Herbert Schildt, TMH.
2. Under tanding OOP with Java, up dated edition, T.Budd, Pears on education.

REFERENCE BOOKS :

1. An Introduction to programming and OO design using Java, J. Nino and F.A. Hosch, John Wiley & sons.
2. An Introduction to OOP, second edition, T. Budd, pearson education.
3. Introduction to Java programming 6th edition, Y. Daniel Liang, pearson education.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - II Semester	**3**	**0-0-0**	**3**

(F225B) DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION

(Common to CSE & IT)

Course objectives:

At the end of the course, students will :

1. Get the fundamental knowledge of the basic structure and operation of a digital computer.
2. Solve logic expression and design combinational circuits.
3. Discuss operation of arithmetic unit including implementation of fixed-point and floating-point addition, subtraction, multiplication and division.
4. Classify different hierarchical memory systems including cache memory and virtual memory.
5. Recognize different ways of communicating with input/output devices and standard i/o interfaces.

Course outcomes:

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

1. Describe basic structure of digital computer.
2. Attains knowledge of different digital logic circuits.
3. Apply arithmetic operations of binary number systems.
4. Describe organization of control unit and arithmetic logic unit.
5. Acquire knowledge on input/output organization.

UNIT - I:

Basic Structure of Computers

Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Computer Generations.

Data Representation: Binary Numbers Fixed Point Representation. Floating – Point Representation. Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes.

UNIT - II:

Digital Logic Circuits - I

Basic Logic Functions, Logic gates, universal logic gates, Minimization of Logic expressions. Flip-flops, Combinational Circuits.

Digital Logic Circuits -II: Registers, Shift Registers, Binary counters, Decoders, Multiplexers, Programmable Logic Devices.

UNIT - III:

Computer Arithmetic

Algorithms for fixed point and floating point addition, subtraction, multiplication and division operations. Hardware Implementation of arithmetic and logic operations, High performance

arithmetic.

Instruction Set & Addressing: Memory Locations and Addresses, Machine addresses and sequencing, Various Addressing Modes, Instruction Formats, Basic Machine Instructions. IA-32 Pentium example.

UNIT - IV:

Processor Organization

Introduction to CPU, Register Transfers, Execution of Instructions, Multiple Bus Organization, Hardwired Control, Micro programmed Control.

Memory Organization: Concept of Memory, RAM, ROM memories, memory hierarchy, cache memories, virtual memory, secondary storage, memory management requirements.

UNIT - V:

Input / Output Organization

Introduction to I/O, Interrupts- Hardware, Enabling and disabling Interrupts, Device Control.

Direct memory access, buses, interface circuits, standard I/O Interfaces.

Text Books:

1. **Computer Organization** – Carl Hamacher, Zvonko Vranesic, Safwat Zaky, fifth edition, McGraw Hill.
2. **Computer Architecture and Organization**- An Integrated Approach, Miles Murdocca, Vincent Heuring, Second Edition, Wiley India.

Reference Books:

1. **Computer Systems Architecture** – M.Moris Mano, IIIrd Edition, Pearson
2. **Computer Organization and Architecture** – William Stallings Sixth Edition, Pearson
3. **Digital Logic Design & Computer Organization** with Computer Architecture for Security-Nikrouz Faroughi, McGrawHill Education

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B.Tech : IT	**L**	**T-P-D**	**C**
II Year II- Semester	**3**	**1-0-0**	**4**

(F225C) DESIGN AND ANALYSIS OF ALGORITHMS

(Common to CSE & IT)

Course objectives:

At the end of the course, students will :

1. Know about on time and space complexity and learning asymptotic notations
2. Understand union and find algorithms, connected components and bi-connected components.
3. Gain knowledge in divide and conquer methods
4. Familiar with greedy method and dynamic programming
5. Understand the back tracking and can application

Course outcomes:

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

1. Gain knowledge on time complexity and space complexity and learn asymptotic notations such as big oh, omega, and theta notations.
2. Understand union and find algorithms, connected components and bi-connected components.
3. Master divide and conquer method and can apply this to solve some sorting and searching problems.
4. Be familiar with greedy method and dynamic programming can apply these to solve verity of problems.
5. Gain knowledge on back tracking and can apply this to solve n-queens problem, sum of subsets problem, graph coloring problem and Hamiltonian cycles problems.

UNIT - I:

Introduction
Algorithm, Pseudo Code for expressing Algorithms, Performance Analysis: Space Complexity, Time Complexity, asymptotic Notations: Big-oh Notation, Omega Notation, Theta Notation, Little-oh Notation.
Disjoint Sets: Disjoint Set Operations, Union and Find Algorithms, Spanning Trees, Connected Components and Biconnected Components.

UNIT - II:

Divide and Conquer
General Method, Applications: Binary Search, Quick Sort, Merge Sort, Stassen's Matrix Multiplication.

Greedy Method
General Method Applications: Job Sequencing with Deadlines, 0/1 Knapsack Problem, Minimum Cost Spanning Trees: Prim's and Kruskal's Algorithms, Single Source Shortest Path Problem, Huffman Codes.

UNIT - III:

Dynamic Programming
General Method, Principle of Optimality, Applications: Multistage Graphs, Matrix Chain Multiplication, Optimal Binary Search Trees, 0/1 Knapsack Problem.

All Pairs Shortest Path Problem, Travelling Sales Person Problem, Reliability Design.

UNIT - IV:

Backtracking
General Method, Applications: Nqueen Problem, Recursive Permutation Generator, Sum of Subsets Problem, Graph Coloring, Hamiltonian Cycles.

UNIT - V:

Branch and Bound
General Method, Applications: Travelling Sales Person Problem, 0/1 Knapsack Problem, LC Branch and Bound Solution, FIFO Branch and Bound Solution.
NP-Hard and NP-Complete Problems: Basic Concepts, Non-Deterministic Algorithms, NP-Hard and NP-Complete Classes, Cook's Theorem.

TEXT BOOKS:

1. Fundamentals of Computer Algorithms-Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia Publications Pvt. Ltd.
2. Introduction to Algorithms-T.H.Cormen, C.E.Leiserso, R.L.Rivest and C.Stein, 2nd Edition, Pearson Education, PHI Pvt. Ltd.

REFERENCE BOOKS:

1. Algorithm Design: Foundations, Analysis and Internet Examples-M.T.Goodrich and R.Tomassia, John Wiley and Sons.
2. Introduction to Design and Analysis of Algorithms A strategic Approach-R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, Mc-Graw Hill.
3. Design and analysis of Algorithms-S. Sridhar, Oxford Higher Education.

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B.Tech : IT	**L**	**T-P-D**	**C**
II Year – II Semester	**3**	**0-0-0**	**3**

(F226A) COMPUTER NETWORKS

(Common to CSE & IT)

Course objectives:

At the end of the course, students will :

1. Recognize various layering approaches for networking and understand the functionalities of physical layer.
2. Identify the data link layer protocols, multi access protocols, Ethernet technologies and various internetworking devices.
3. Examine design issues of network layer, services provided to above layer and routing, and congestion control protocols.
4. Examine IP protocol, addressing, various protocols like CIDR, ICMP,ARP and RARP of internet Layer and examination of transport layer services.
5. Examine Transport layer protocols like TCP, UDP, RPC and various congestion controlling mechanisms, including application layer services, protocols like HTTP, FTP, E-Mail etc.

Course outcomes:

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

1. Demonstrate the networking concepts, various Layering approaches and their functionalities.
2. Understand the protocols of Data Link layer, how a medium can be shared among multiple devices, Ethernet technologies and internetworking devices used.
3. Work on fragmentation, assigning of logical address and judge on routing, congestion.
4. Demonstrate the working of IP Protocol, other protocols of internet layer and services of transport layer.
5. Explain the transport layer and application layer protocols, their working.

UNIT - I:

Overview of the Internet: Protocol, Layering Scenario, TCP/IP Protocol Suite: The OSI Model, Internet history standards and administration; Comparison of the OSI and TCP/IP reference model.

Physical Layer: Guided transmission media, wireless transmission media.

UNIT - II:

Data Link Layer: design issues, Framing, Error Detection and Error Correction, Block Coding, Hamming Distance, CRC, Flow control and error Control.

Protocols: Noiseless Channels, Noisy Channels, HDLC, Point to Point Protocols..

Connecting Devices: Repeaters, Hubs, Switches, Gateways and **Bridges -** Learning and Spanning tree bridges.

Multi Access protocols- Random access - . ALOHA, CSMA, CSMA/CD and CSMA/CA,

Controlled access, Channelization. Ethernet IEEE 802.3, IEEE 802.5, IEEE 802.11

UNIT - III:

Network Layer: Network layer design issues, Store and forward packet switching, connection less and connection oriented network services.

Internetworking: Protocols-IPV4 and IPV6**,** Logical Addressing-IPV4, IPV6, Tunnelling and Packet Fragmentation.

Address Mapping: ARP, RARP, DHCP, ICMP and IGMP.

Routing Algorithms: Shortest Path Finding and Distance Vector Routing Algorithms.

UNIT - IV:

Transport Layer: Process to Process Communication, User Datagram Protocol (UDP), Transmission Control Protocol (TCP), The TCP Connection Establishment, The TCP Connection Release.

Crash recovery, The TCP sliding window, The TCP congestion control, Improving Quality of Service Techniques: Leaky Bucket Algorithm.

UNIT - V:

Application Layer: Introduction, services, Application layer paradigms.

Applications: DNS, WWW, HTTP, FTP, E-MAIL, TELNET, SNMP, SSH.

TEXT BOOKS:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.
2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

REFERENCES BOOKS:

1. "Computer Networks", 5E, Peterson, Davie, Elsevier
2. "Introduction to Computer Networks and Cyber Security", Chawan - HwaWu, Irwin, CRC Publications.
3. "Computer Networks and Internets with Internet Applications", Comer .

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B.Tech : IT	**L**	**T-P-D**	**C**
II Year - II Semester	**3**	**0-0-0**	**2**

(F226B) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

(Common to CSE & IT)

Course objectives:

At the end of the course, students will :

1. Know the basic terminology of functions, relations and sets and to demonstrate the knowledge of their associated operations.
2. Understand the principles of permutations, combinations, inclusion/exclusion principle and the pigeonhole methodology.
3. Know how to solve advanced mathematical problems, apply various methods of mathematical proof, and communicate solutions in writing.
4. Select graph theory basics in solving computer science problems.

Course outcomes:

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

1. Apply logic expressions for a variety of applications.
2. Visualize data numerically and/or graphically.
3. Choose mathematical principles and logic design.
4. Use the notions of propositions and predicate formulae, satisfiability and formal proof.
5. Apply logical reasoning to solve a variety of problems to build an expert system.

UNIT - I:

Mathematical Logic:

Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers.

Predicates:

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

UNIT - II:

Relations:

Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram.

Functions:

Inverse Function Composition of functions, recursive Functions, Lattice and its Properties.

Algebraic structures:

Algebraic systems Examples and general properties, Semi groups and monoids, groups, sub groups, homomorphism, Isomorphism.

UNIT - III:

Elementary Combinatorics:

Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems**,**

The principles of Inclusion – Exclusion: The principles of Inclusion – Exclusion**.** Pigeon hole principles and its application.

UNIT - IV:

Generating Functions: Generating Functions, Function of Sequences Calculating Coefficient of generating function,

Recurrence relations: solving recurrence relation by substitution and Generating funds. Characteristics roots solution of In homogeneous Recurrence Relation.

UNIT - V:

Graph Theory:

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

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

Text Books:

1. **Elements of DISCRETE MATHEMATICS**- A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata McGraw Hill.
2. **Discrete Mathematics** by RK Bisht,HS Dhami, Oxford University Press.

Reference Books:

1. **Discrete Mathematics for Computer Scientists & Mathematicians**, J.L. Mott, A. Kandel, T.P. Baker, PHI.
2. **Discrete and Combinational Mathematics**- An Applied Introduction-5th Edition – Ralph. P.Grimaldi.Pearson Education
3. **Discrete Mathematics and its Applications**, Kenneth H. Rosen, Fifth Edition.TMH.

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B.Tech : IT	**L**	**T-P-D**	**C**
II Year - II Semester	**2**	**0-0-0**	**2**

(F220D) BIOLOGICAL SCIENCE

(Common to CSE,ECE,ECM,EEE&IT**)**

Course objectives:

At the end of the course, students will :

Students will be introduced to the basics of biology such as cell structure and functions, inheritance & evolution, systems of human life, basic concepts of genetics, and an introduction to microbiology

Course outcomes:

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

1. Acquire the Knowledge of basic biology
2. Acquire the Knowledge of Human Biological Systems
3. Acquire the knowledge of Nutrients
4. Acquire knowledge of Microorganisms
5. Acquire the knowledge gene expression

UNIT - I:

Basic Biology: Introduction, Living organisms.

Functions of Cell organelles: Cell structure and Organelles, Organogenesis.

UNIT - II:

Human Anatomy: Systems of Life-Digestion, Respiration, Cirulatory Systems.

Excretion, Reproduction, and Nervous systems.

UNIT - III:

Biochemistry: Diet and Nutrition- Macro (Carbohydrates, proteins, lipids) - and Micronutrients (vitamins).

Minerals: Essential minerals and their role; deficiency symptoms and their role; deficiency symptoms.

UNIT - IV:

Microbiology: Micro organisms-Classification of Microorganisms.

Advantages and disadvantages of microorganisms: Beneficial and harmful effects of Bacteria, Fungi and Viruses.

UNIT - V:

Genetics: Basic principles of Mendel, molecular genetics, structure and function of genes and chromosomes.

Gene expressions: Transcription and Translation, gene expression and regulation

Text Books:

1. P K Gupta ,"Elements of Biotechnology", RASTOGI Publications
2. Dr RC Dubey ,"Advanced Biotechnology", S Chand Publications.

Reference Books:

1. "Cell biology",Rastogi Publications
2. Microbiology,PELCZAR
3. Biotechnology,U.sathyanarayana

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B.Tech : IT	L	T-P-D	C
II Year -II Semester	2	0-0-0	0

(F220E) ENVIRONMENTAL SCIENCES

(Common to CSE,ECE,ECM,EEE&IT**)**

Course objectives:

At the end of the course, students will :

1. To know the importance of Environment is a key to the future of mankind.
2. Global warming,the depletion of ozone layer and loss of biodiversity have made everyone aware of environmental issues
3. Study of environmental studies encourages students to explore the social, aesthetic, ethical, scientific, and technical aspects of environmental issues.
4. we can apply modeling to understand the behavior make predictions for future and plan management in view of changing environmental conditions

Course outcomes:

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

1. Understand the importance of natural resources and use them efficiently and knowing how to conserve biodiversity
2. Imply environment plan in developing in any sort of environmental projects.
3. Apply the environmental legislation in every walk of life and reserve the natural resources for future generations in sustainable manner.

UNIT - I:

Ecosystems & Natural Resources, **Biodiversity:** Concept, Classification of Resources: Water resources, Land resources, land degradation, Forest resources, Mineral resources, Energy resources.

Concept of ecosystem: Classification of ecosystem, Functions of ecosystem. Biodiversity, Level, values, hotspots of biodiversity, Threats To Biodiversity, Conservation Of Biodiversity.

UNIT - II:

Global Environmental Problems And Global Efforts: Deforestation, Green house effect, Global Warming, Sea level rise, Ozone depletion. International conventions/protocols: green-belt-development, Concept of Green Building, Clean Development Mechanism (CDM).

Environmental Impact Assessment (EIA) And Environmental Management Plan: Definition of Impact, classification of impacts, methods of baseline data acquisition. Impacts on different components: such as human health resources, air, water, flora, fauna and society, impact assessment methodologies. Environmental management plan (EMP).

UNIT - III:

Environmental Policy, Legislation, Rules And Regulations : Environmental Protection Act: Air (Prevention and control of pollution) Act-1981, Water (Prevention and control of pollution) Act-1974, Forest Conservation Act **.**

Towards Sustainable Future: Concept of Sustainable Development, Threats to Sustainability, Strategies for achieving Sustainable development, Environmental Ethics, Environmental Economics, Concept of Green Computing.

TEXT BOOKS:

1. **TEXT BOOK OF ENVIRONMENTAL Science and Technology** by M.Anji Reddy 2007
2. **Principles of Environmental Science and Engineering** by P.Venugopal Rao.
3. **Introduction to Environmental Studies** by K.Mukkanti
4. **Text book of Environmental studies by Kaushik&Anubha kaushik**

REFERENCE BOOKS:

1. **Tata McgrawHill :** Introduction to Environmental Studies by Benny Joseph
2. **Environmental Studies** by Erach Bharucha 2005, University Grants Commission, University Press.

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B.Tech : IT	**L**	**T-P-D**	**C**
II Year –II Semester	**0**	**0-4-0**	**2**

(F2261) COMPUTER NETWORKS LAB

(Common to CSE & IT)

Course objectives:
At the end of the course, students will :

1. Implement data link layer farming methods such as : Character Stuffing and Bit Stuffing.
2. Identify Error control technique such as CRC-12 CRC-16 CRC-32.
3. Implementation Hamming Code error control algorithm and simulation of stop and wait protocol and Client-Server program
4. Implement network layer routing algorithms such as : Dijkstra's, Distance Vector and Broadcast routing techniques.
5. Identify addressing like port and IP Addresses.

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

1. Understand data link layer framing methods such as : Character Stuffing Bit Stuffing
2. Write Error control techniques such as CRC-12 CRC-16 CRC-32.
3. Design Simulation of stop and wait protocol and Client-Server program
4. Understand network layer routing algorithms such as : Dijkstra's, Distance Vector and Broadcast routing techniques.
5. Realize Hamming Code error control algorithm

Experiment 1.
Implement the data link layer framing methods such as character stuffing and bit stuffing.

Experiment 2.
Implement the CRC polynomials - CRC 12, CRC 16 and CRC 32.

Experiment 3.
Implement the CRC encoding and decoding.

Experiment 4.
Implementation of Hamming Code.

Experiment 5.
Simulation of Stop and wait protocol.

Experiment 6.
Simulation of Stop and wait ARQ.

Experiment 7.
Implement of Dijsktra's Algorithm for finding Shortest Path.

Experiment 8.
Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm.

Experiment 9.
Take an example subnet of hosts. Obtain broadcast tree for it.

Experiment 10.
Write a program to display the socket's port and IP address

Experiment 11.
Simulation of TCP client and server program.

Experiment 12.
Using Sniffing tool Capture packets and Analyze.

TEXT BOOKS:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.
Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

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B.Tech : IT	**L**	**T-P-D**	**C**
II Year - II Semester	**0**	**0-4-0**	**2**

(F2251) OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB
(Common to CSE, IT & ECM)

Course objectives:

At the end of the course, students will :

1. Write java programs using arithmetic operators ,control statements, type conversion, constructors and string handling
2. Explain how to write java programs using inheritance and polymorphism
3. Explain how to write java programs for creation of user defined packages and interfaces
4. Familiar with exception handling, multithreading and event handling
5. Explain how to write java programs using applets.

Course outcomes:

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

1. Write java programs using arithmetic operators ,control statements, type conversion, constructors and string handling
2. Write java programs for inheritance and polymorphism
3. Write java programs for creation of user defined packages and interfaces
4. Write java programs for exception handling and multithreading
5. Write java programs for creation of applets

Experiment 1:
Write java programs that implement the following
a) Constructor b) Parameterized constructor
c) Method overloading d) Constructor overloading.

Experiment 2:
a) Write a Java program that checks whether a given string is a palindrome or not.
Ex: MADAM is a palindrome.
b) Write a Java program for sorting a given list of names in ascending order.
c) Write a Java Program that reads a line of integers, and then displays each integer and the sum of all the integers (Use String Tokenizer class of java.util

Experiment 3:
Write java programs that uses the following keywords
a) this b) super
c) static d) final

Experiment 4:
a) Write a java program to implement method overriding
b) Write a java program to implement dynamic method dispatch.
c) Write a Java program to implement multiple inheritance.
d) Write a java program that uses access specifiers

Experiment 5:

a) Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.

b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.

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

Experiment 6:

a) Write a Java program for handling Checked Exceptions.

b) Write a Java program for handling Unchecked Exceptions

Experiment 7:

a)Write a Java program that creates three threads. First thread displays "Good Morning" every one second, the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every three seconds.

b)Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication

Experiment 8:

a) Develop an applet that displays a simple message.

b) Develop an applet that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named "Compute" is clicked

Experiment 9:

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

Experiment 10:

a) Write a Java program for handling mouse events.

b) Write a Java program for handling key events.

Experiment 11:

1. Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields Num1 and Num 2.

The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1or Num2 were not an integer, the program would throw Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception and display the exception in a message dialog box.

Experiment 12:

a) Write a java program that simulates traffic light. The program lets the user select one of three lights: red, yellow or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No l Light is on when the program starts.

b) Write a Java program that allows the user to draw lines, rectangles and ovals

Experiment 13:

Create a table in Table.txt file such that the first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using JTable component

TEXT BOOKS:

1. Java;the complete reference,8th editon ,Herbert Schildt, TMH.
2. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.
3. Introduction to Java programming, Sixth edition, Y.Daniel Liang, Pearson Education.
4. Big Java, 2nd edition, Cay Horstmann, Wiley Student Edition, Wiley India Private Limited