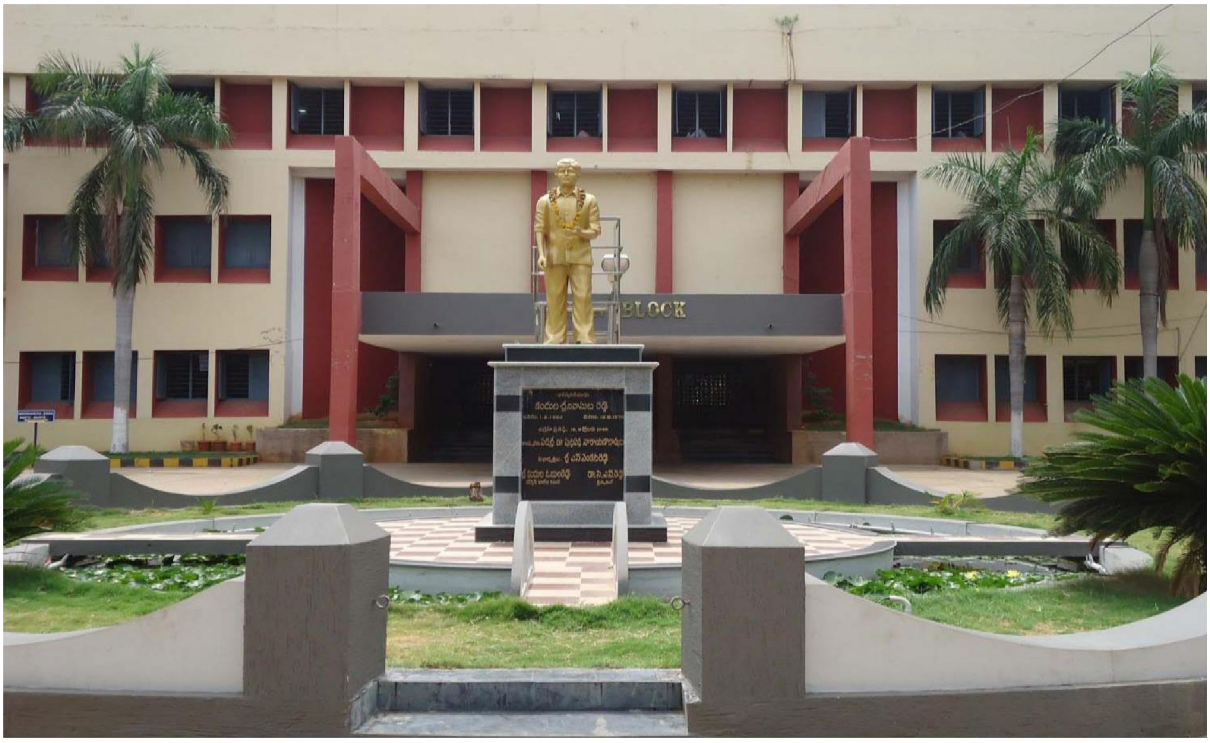
Regulations for

UG Programs in Engineering (R18UG)

(Effective from 2018-19 for Regular students and from 2019-20 for Later Entry students) Incorporating Amendments as on 15.06.2019



Kandula Srinivasa Reddy Memorial College of Engineering (Autonomous)

Kadapa 516003 AP

(Approved by AICTE, Affiliated to JNTUA, Ananthapuramu, Accredited by NAAC)

(An ISO 9001-2008 Certified Institution)

KSRM College of Engineering (Autonomous), Kadapa-516003, AP

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(Effective from 2018-19)

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1.0 Nomenclature

1.1 *Academic Year*: Period of academic instruction of, approximately, one year duration that usually starts in June/July and ends in April/May next
1.2 *Semester*: Either of two divisions of an academic year
1.3 *Major*: A specific fieldof study. Example: Civil Engineering
1.4 *Minor*: An area outside of, or complementary to, a Major. Example: For Civil Engineering major, Computer Science is a minor and vice versa
1.5 *Subject*: An area of knowledge that is studied as part of a Course
1.6 *Core*: A subject that is mandatory for a Major course of study
1.7 *Elective*: A subject that is selected for study to suit one's individual needs
1.8 *Mandatory Subject*: A subject that is studied to meet certain requirements but has no credits assigned to it
1.9 *Humanities subjects*: Subjects that describe and interpret human achievements, problems and historical changes at individual and societal levels covering the disciplines of literature, history, and philosophy
1.10 *Social Sciences*: Subjects that describe the mental and behavioural activities of individuals, groups, organizations, institutions, and nations covering the disciplines of anthropology, economics, linguistics, political science, and psychology
1.11 *Exam*: A test to measure one's progress, knowledge, or ability in a subject
1.12 *Credit*: A numerical weight given to a subject, usually based on quantum of academic work
1.13 *Grade*: A numerical or alphabetic designation measuring the level of achievement in an exam
1.14 *Attendance*: Physical presence of oneself in a classroom/laboratory for purpose of a scheduled academic instruction
1.15 *Course*: A series of subjects that constitute a Major field of study
1.16 *Branch*: Same as Course
1.17 *Program*: Same as Course
1.18 *Degree*: An academic title conferred to honour distinguished achievement
1.19 *Minor Degree*: An Academic honour conferred on achieving 20 extra credits in one's minor area of study
1.20 *Honours*: An Academic honour conferred on achieving 20 extra credits in one's major area of study

2.0 Short Title and Application

2.1 These rules and regulations may be called as R18UG and come into force from Academic Year 2018-19 and exist until superseded by new regulations. These rules are applicable for students who join the institute from academic year 2018-19 onwards. Students who have joined in earlier regulations will continue in their respective regulations

2.2 These rules and regulations are applicable to all under graduate courses in engineering and technology leading to Bachelor's Degree in Technology (B. Tech)

2.3 The Majorcourses offered, at present, are:

2.3.1 Civil Engineering

2.3.2 Electrical and Electronics Engineering

2.3.3 Mechanical Engineering

2.3.4 Electronics and Communications Engineering

2.3.5 Computer Science and Engineering

2.4 The Institute may offer new Majors in future to which these rules and regulations will be applicable

3.0 Suspension and Amendment of Rules

3.1 Academic Council has the authority to suspend a rule temporarily

3.2 Academic Council has the authority to amend a rule

3.3 For affirmative action on any suspension or amendment of a rule, an affirmative vote of three-fifths of the members present and voting shall be required in Academic Council

4.0 Requirements for Admission

4.1 At present, admissions into first-year class of various Majors are governed by Government and the Affiliating University. The eligibility criteria and procedure for admission are prescribed by Government and Affiliating University

4.2 A student is not allowed change of Major after admission into first-year

4.3 A student must fulfil medical standards required for admission

4.4 The selected students are admitted into first-year class after payment of the prescribed fees

5.0 Structure of the B. Tech course

5.1 *Duration*: The duration of B. Tech degree course is eight semesters spread over four academic years. Semesters are named sequentially from First Semester to Eighth Semester

5.2 *Working Days*: Calendar for any semester shall be announced at least four weeks before its commencement. Minimum number of working days shall be 90 for any semester

5.3 *Curriculum*: Each major shall havecore, elective and mandatory subjects drawn from six categories of subject areas -i) Basic Sciences (BSC), ii) Humanities and Social Sciences including Management Courses (HSMC), iii) Engineering Science Courses (ESC), iv) Professional Core Course (PCC), v) Professional Elective Course (PEC), and vi) Open Elective Course (OEC). The curriculum for each branch shall be approved by its corresponding Board of Studies and Academic Council

5.4 *Credits*: All subjects that are assessed for marks have credits assigned to them. The credits assigned to subjects shall be given in curriculum. The total number of credits for entire course is 160 forall branches.

5.5 *Curriculum and Syllabus*: The curriculum and syllabus for first and second semesters is given in Annexure-1 and Annexure-2 respectively

5.6 *Medium of Instruction*: The medium of instruction, examinations and all other related activities is English

5.7 *Responsibility and Advising*: It is the responsibility of the student to understand and know the regulations and requirements to earn the degree. Each student admitted in to the degree programs is assigned to a Faculty Advisor who assists the student in designing an effective program of study. Students should consult their Faculty Advisors for selection of electives and for general advice on academic program

6.0 Registration and Enrolment

6.1 Prior to start of each semester, every student shall register for all the subjects listed in curriculum and additional subjects required for achieving honours/ minor degree. Excepting first semester, the registration for a semester shall be done during a specified week after end examinations of previous semester. In first semester, the registration shall be done within six working days from date of joining. Recommendation of Faculty Advisor is needed for registration.

6.2 A student can register utmost 8 theory subjects, including mandatory subjects, in any semester.

6.3 Late registration will be permitted with a fine, decided from time to time, up to six working days from the last date specified for registration

6.4 A student will be eligible for registration for a semester if she or hei) is promoted to that semester, ii) has cleared all fees to the Institute, library and hostel of previous semester, and iii) is not disqualified for registration by a disciplinary action of the Institute

6.5 A student will be enrolled and allowed to attend the classes on successful registration and payment of necessary fees to Institution, library, and hostel

6.6 Registration and enrolment will be controlled by the Office of the Controller of Examinations

7.0 Assessment Procedure – Internal Tests and End Examinations

7.1 Performance of students in all subjects is assessed continuously through assignments, internal assessment tests and an End examination

7.2 Allocation of internal assessment and End examination marks

7.2.1 For theory subjects, the allocation is 30 marks for internal assessment and 70 marks for End examination totalling 100 marks

7.2.2 For laboratory/drawing/project work subjects, the allocation is 50 marksfor internal assessment and 50 marks for End examination totalling 100 marks

7.2.3 For seminar/industrial training/internship subjects, the allocation is 100 marks for internal assessment.There is no end examination for these subjects

7.2.4 For mandatory subjects the allocation is 30 marks for internal assessment and no allocation for End examination. These marks are specified for purpose of clause 9.3, and do not account for any credits

7.3 Internal Assessment

7.3.1 Internal assessment means performance evaluation of students by faculty members who teach the subjects

7.3.2 For each theory subject, including mandatory subjects, the internal assessment shall be done by two midterm tests for 25 marks and assignments for 5 marks. The faculty member of the concerned subject will assess the marks in midterm tests and assignments.

Each midterm test will be of two hours duration and evaluated for 25 marks. Internal assessment marks for midterm tests will be calculated as weighted sum of the two midterm test marks, with 80% weight for the best and 20% weight for the other marks. Internal assessment marks for assignments is calculated as the average of all assignments. Total internal marks is the sum of midterm tests and assignments assessment marks

If any student abstains for any midterm test, she or he will be awarded zero marks for that midterm test. If any student fails to submit any assignment within the specified deadline, she or he will awarded zero marks for that assignment

The guidelines for internal assessment are given in Annexure 3

7.3.3 For laboratory/practical/drawing subjects, the internal assessment will be based on regular laboratory work over full semester. The assessment will be done by the faculty concerned. The students shall be informed sufficiently early of the procedure to be followed for internal assessment

7.3.4 For subjects like seminar, project-work, industrial training/internship, and comprehensive viva-voce, the internal assessment will be done by a Department Committee consisting of two senior faculty members and faculty guide of concerned student. The assessment procedure will be informed sufficiently early to the students

7.4 End examinations

7.4.1 End examinations shall be conducted after completion of coursework in each semester

7.4.2 The question papers for theory subjects shall be set by faculty members outside of the Institute. The external faculty members for question paper setting shallbe appointed by the Principal

7.4.3 Evaluation of answer scriptsshall be done by either Internal or External examiners appointed by the Principal. A minimum of 50% of subjects will be evaluated by external examiners.

7.4.4 For laboratory subjects, end examination shall be conducted by a committee consisting of twointernal examiners. One examiner shall be appointed by Head of Department of concerned Major, and the other examiner shall be appointed by the Principal

7.4.5 For project work viva-voce, end examination shall be conducted by a committee consisting of one internal examiner, one external examiner, and the concerned guide of the student. Internal examiner shall be appointed by Head of Department of concerned Major, and the external examiner shall be appointed by the Principal

7.4.6 If a student abstains from End examination of any subject, for any reason, she or he shall be awarded zero marks in that subject

7.4.7 There is no end examination for mandatory subjects

8.0 Method of Assigning Letter Grades and Grade Points

8.1 For all credit-bearing subjects, performance of a student in a subject is indicated by a letter grade that corresponds to absolute marks earned in that subject. Each letter grade is assigned a numeric Grade Point that is used to compute Grade Point Average on a scale of 0 to 10

8.2 Performance of a student in both internal assessment and End examination will be considered for awarding grades for credit bearing subjects. Total marks earned in a subject is the sum of marks obtained in internal assessment and End examination in that subject

8.3 Pass grade A+ to D- is assigned to a subject based on total marks earned in that subject provided that a student earns at least i) 35% of marks in End examination marks and ii) 40% of marks in internal assessment and End examination marks put together; otherwise fail grade F will be assigned to that subject

8.4 Grade I will be assigned to a subject if a disciplinary action is pending and is not resolved before publication of results. Office of Controller of Examinations shall resolve the pending disciplinary action within six working days from the date of publication of results and change the grade to any of A+ to D- or F

8.5 Grade X will be assigned to a subject if a student abstains for End examination of that subject

8.6 The absolute marks and corresponding letter grade and grade points are given in Table 1

Table 1 Letter Grades and Grade Points

Absolute Marks	Letter Grade	Grade Points	Remark
95-100	A+	10.0	Pass
90-94	A	9.5	Pass
85-89	A-	9.0	Pass
80-84	B+	8.5	Pass
75-79	B	8.0	Pass
70-74	B-	7.5	Pass
65-69	C+	7.0	Pass
60-64	C	6.5	Pass
55-59	C-	6.0	Pass
50-54	D+	5.5	Pass

45-49	D	5.0	Pass
40-44	D-	4.5	Pass
0-39	F	0.0	Fail
-	I	0.0	Result Withheld
-	X	0.0	Absent for End Exam

8.7 *SGPA*: Semester Grade Point Average indicates the performance of a student in all credit-bearing subjects of a semester. SGPA is calculated as the weighted average of Grade Points of allsubjects of the semester with corresponding credits of subjects as weights.

8.8 *CGPA*: Cumulative Grade Point Average indicates the performance of a student in all semesters up to and including the current semester under consideration. CGPA is calculated as the weighted average of SGPAs with total credits in each semester as the weights.

8.9 In *SGPA / CGPA* calculations credits earned towards honours / minor degree will not be counted.

8.10 *Grade Card*: All students shall be issued Grade Cards after the publication of results of a semester. Grade Card is a statement of performance of a student in a semester. It contains information about each registered subject: type of subject, allocated credits, and letter grade earned.SGPA and CGPA will also be indicated

9.0 Requirements for Completing Subjects

9.1 A student shall complete all credit-bearing and mandatory subjects successfully to be eligible for award of degree

9.2 *Credit-bearing subjects*: A student is considered to have completed a credit-bearing subject successfully and earned credits if she or he obtains a pass grade from A+ to D- in that subject. If a student receives fail grade F or X in any subject, she or he must register for supplementary End examination for that subject as and when opportunity arises and improve grade to pass grade

9.3 *Mandatory subjects*: A student is considered to have successfully completed a mandatory subject if she or he earns at least 40% of internal assessment marks in that subject.

Supplementary exam for mandatory subjects: If a student fails in mandatory subject, she or he shall register for supplementary examination in that subject as and when the opportunity arises and pass that subject. The supplementary exam will be conducted for 30 marks covering the entire syllabus and student is deemed to have passed in the subject if she or he earns 12 marks (40% marks) in the supplementary exam, disregard of her or his performance in assignments and internal tests.

10.0 Requirements for taking End Examinations and Promotion

10.1 A student is eligible to take regular End Examinations of current semester if she or he full fills the attendance requirement

10.2 A student shall be promoted from current semester to succeeding semester on satisfying the attendance and total credits-earned requirements

10.3 Attendance Requirement

10.3.1 Attendance of students shall be recorded for credit-bearing and mandatory subjects as per the workload indicated in curriculum

10.3.2 Total class-periods conducted shall be reckoned from beginning to end of a semester as published in academic calendar

10.3.3 Aggregate Percentage of Attendance is calculated using total number of class-periods attended as numerator and total number of class-periods conducted for the concerned semester as the denominator

10.3.4 A minimum aggregate attendance of 75% is required for promotion to succeeding semester and be eligible to take End examinations of current semester

10.3.5 A student can appeal to the Principal for condoning deficiency in aggregate attendance if she or he gets an aggregate attendance of 65% or more but less than the required 75%, presenting a valid reason for deficiency. Such a student will be granted promotion if the Principal pardons the deficiency. Principal has the right to reject the appeal if he/she is not satisfied with the performance of the student or the reason cited for deficiency of the attendance

10.3.6 A student earning less than 65% aggregate attendance will be denied promotion. A student who is not promoted on basis of attendance shall be removed from the rolls and shall register for the same semester when opportunity arises. The current semester record of the student is cancelled automatically

10.4 Credits-Earned Requirement

10.4.1 This rule is applicable for promotion of a student from fourth semester to fifth semester, and from sixth semester to seventh semester

10.4.2 A student who is denied promotion for want of requisite credits shall take supplementary examinations, as and when offered, and earn credits to be eligible for promotion.

10.4.3 Subjects registered for honours/minor degree shall not be considered towards credits-earned requirement.

10.4.4 For promotion from fourth semester to fifth semester, a student must earnat least 40% credits (rounded to lower integer) from first semester to third semester subjects. A student will get the following opportunities to pass the subjects:

First semester subjects: One regular and three supplementary exams
Second semester subjects: One regular and two supplementary exams
Third semester subjects: One regular and one supplementary exam.

10.4.5 For promotion from sixth semester to seventh semester, a student must earn at least 40% credits (rounded to lower integer) from first semester to fifth semester subjects. A student will get the following opportunities to pass the subjects:

First semester subjects: One regular and five supplementary exams
Second semester subjects: One regular and four supplementary exams
Third semester subjects: One regular and three supplementary exams
Fourth semester subjects: One regular and two supplementary exams
Fifth semester subjects: One regular and one supplementary exam

11.0 Revaluation of End Examination Scripts

11.1 Revaluation of End Examination scripts is allowed for theory subjects only by paying requisite fee

11.2 Procedure for Revaluation: The script will be revaluated by an examiner appointed by the Principal. The maximum of revaluation and regular end examination marks will be awarded for that subject

11.3 A student can apply for revaluation in a subject only once

12.0 Supplementary End Examinations

12.1 Students are eligible to take Supplementary examinations in subjectswith fail grade either F or X only

12.2 Supplementary examinations for even semester subjects will be conducted along with regular examinations of odd semester subjects

12.3 Supplementary examinations for odd semester subjects will be conducted along with regular examinations of even semester subjects

12.4 For eighth semester, special supplementary examinations will be conducted in second week following the results publication date of regular examination of eighth semester

12.5 A student will be allowed to improve grade in any theory subject provided she or he has completed coursework of all semesters but before award of provisional/final degree

13.0 Requirements for Award of B. Tech degree

13.1 Time Limit for completion of requirements for award of degree is eight academic years from the date of admission. A student who could not complete all the requirements in this time limit shall forego admission and will be removed from the rolls of the Institute

13.2 A student shall be eligible for award of B. Tech degree provided she or he has:

13.2.1 Registered and successfully completed all required credit-bearing and mandatory subjects with a total of 160 credits

13.2.2 Secured a CGPA of 4.5 or more

13.2.3 Cleared all dues to the Institute, library and hostel

13.2.4 No disciplinary action is pending against her or him

13.2.5 Satisfied any other stipulation of the affiliating University

13.3 *Award of Class*: Each student will be given class in degree based on CGPA as follows:

Table 2 Class of Degree

Class of Degree	Range of CGPA
Pass Class	>= 4.5 but <5.5

Second Class	>= 5.5 but <6.5
First Class	>= 6.5 but <7.5
First Class with Distinction	>= 7.5

13.4 *Degree with Honours designation*: Students with higher learning capabilities are encouraged to opt for Honours designation. Degree with Honours imply a higher level of academic achievement. A student can earn BTech degree with honours designation by meeting the following requirements

13.4.1 Honours designation is optional. A student can opt for either Honours designation or Minor degree (clause 13.5) but not both

13.4.2 Entry eligibility: Students shall apply for Honours designation at the beginning of the fifth semester. Eligibility criteria are (i) minimum CGPA of 8.0 and (ii) no backlogs, reckoned up to third semester. The Chairperson of the concerned Board of Studies will process the applications and publish the list of eligible students

13.4.3 Additional coursework: Students shall complete an additional 20-credits coursework, in addition to 160 regular credits, in her/his own major during fifth to eighth semesters. The Board of Studies (BoS) of the concerned major shall specify the list of advanced elective subjects for the purpose of honours designation. The elective subjects can be studied either by conventional classroom teaching or as online MOOCs on the recommendation of the Chairperson of the concerned BoS

13.4.4 Registration and enrollment: Clause 6.0 shall apply

13.4.5 Evaluation: The evaluation shall be as per clause 7.0

13.4.6 Continuous performance: Students shall earn a minimum SGPA of 8.0 in all semesters, from fifth to eighth, and without backlogs to be eligible for award of Honours designation. Regular and additional subjects shall be considered for SGPA calculation. If a student does not get a minimum SGPA of 8.0 or fails in any subject during fifth to eighth semesters, she/he will lose candidature for honours designation

13.5 *Minor Degree designation*: Students with higher learning capabilities are encouraged to opt for Minor degree designation. Minor degree imply a higher level of academic achievement and improves employability. A student can earn minor degree designation by meeting the following requirements

13.5.1 Minor degree is optional. A student can opt for either Minor degree or Honours designation (clause 13.4) but not both.

13.5.2 Entry eligibility: Students shall apply for minor degree at the beginning of fifth semester. Eligibility criteria are (i) minimum CGPA of 7.5 and (ii) no backlogs, reckoned up to third semester. The Chairperson of the concerned Board of Studies (minor department) will process the applications and publish the list of eligible students

13.5.3 Additional coursework: Students shall complete an additional 20-credits coursework, in addition to 160 regular credits, in selected minor program during fifth to eighth semesters. The Board of Studies (BoS) of the concerned minor program shall specify the list of core and elective subjects for the purpose of minor degree. The core/elective subjects can be studied either by conventional classroom teaching or as online MOOCs on the recommendation of the Chairperson of the concerned BoS (minor program)

13.5.4 Registration and enrollment: Clause 6.0 shall apply

13.5.5 Evaluation: The evaluation shall be as per clause 7.0

13.5.6 Continuous performance: Students shall earn a minimum SGPA of 7.5 in all semesters, from fifth to eighth, and without backlogs to be eligible for award of minor degree. Regular and additional subjects shall be considered for SGPA calculation. If a student does not get a minimum SGPA of 7.5 or fails in any subject during fifth to eighth semesters, she/he will lose candidature for minor degree

13.6 Degree will be issued under the seal of affiliating University

14.0 Transitory Regulations

14.1 A student who initially joins the Institute in a previous Regulation and has to re-join in a semester of the present Regulations, due to any reason, shall be bound by the rules of the current Regulations. Board of Studies of the concerned Major will specify, extra or otherwise, academic coursework to be undertaken by such students who join the current Regulations.

Regulations for Lateral Entry Students under R18UG

(Approved in Academic Council meeting held on 15-06-2019)

1.0 *Title and application*: These rules and regulations may be called R18UG-LE and come into force from academic year 2019-20 and exist in force until superseded by other regulations. These regulations are applicable to students admitted under lateral entry scheme leading to Bachelor's Degree in Technology (B.Tech).

2.0 Regulations and curriculum: The regulations and curriculum of R18UG shall be applicable in general with the following modifications:

2.1 Entry and duration: The students will be admitted directly into third semester of regular 4-year B.Tech degree course governed by R18UG regulations. The duration of the course is three academic years

2.1 Curriculum: Third semester to eighth semester curriculum of R18UG

2.2 Promotion by credits-earned requirement: This is applicable for the promotion of a student from sixth semester to seventh semester only. She/he must earn at least 40% of total credits (rounded to lower integer) from third to fifth semesters for promotion from sixth semester to seventh semester

2.3 Requirements for the award of B.Tech degree:

2.3.1 Time limit for completion of requirements for award of degree is six academic years from the date of admission

2.3.2 Registered and successfully completed all required credit-bearing and mandatory subjects with a total of 122 credits (third semester to eighth semester subjects)

2.3.3 Honours/minors designation: shall earn extra 20 credits in addition to 122 credits

3.0 In case of ambiguity in the interpretation of regulations, the decision of the academic council shall be final

Annexure-3 Guidelines for Internal Assessment

The following guidelines shall apply for internal assessment of theory subjects

A3.1. Purpose

The purpose of internal assessment is to engage students in continuous learning

A3.2. Guidelines

a. *Allocation*: For theory subjects the total internal assessment marks is 30 of which 25 marks are assessed thorough midterm tests and 5 marks by assignments

b. *Assignments*: The assignments shall aid and hone the daily routine of students. Assignments shall be stimulating and thought provoking to the student. While some questions may test student's understanding of the subject, there shall be questions that imply connect to real world applications. A variety of questions can posed in assignments

i. *Number:* A minimum of four assignments shall be given in each subject with one assignment from Unit I to IV of syllabus of that subject

ii. *Quantum of work*: An assignment shall take about four to six hours of study/work per week. Assignments shall not be overloaded nor under loaded. As a guideline, each assignment may contain five questions, each question taking an hour to answer

iii. *Marks*: Each assignment must be evaluated for fifty marks. Final marks is obtained by averaging all the assignment marks and reducing it to five marks

iv. *Deadlines*: Students shall be given at least one-week time to complete and submit assignments. Assignments shall be submitted within deadline. Late submissions should be awarded zero marks

v. *General*: It is advised to administer assignments using Google Classroom

c. *Midterm tests*: Midterm tests shall check students' understanding and application concepts learned in the subjects. Performance in these tests is a direct measure the course outcomes (COs)

i. *Number and duration*: There shall be two midterm tests each with a duration of two hours. Time duration for objective part is 20 minutes and that for subjective part is 100 minutes

ii. *Format of test and division of marks*: Internal test shall consist of two parts: objective part for 5 marks and subjective part for 20 marks

iii. *Objective part*: Objective part shall contain twenty objective questions. The type of questions can be multiple choice, fill the blank, matching etc.

iv. *Subjective part*: Subjective part shall contain four questions and all questions shall be answered. However, each question can have internal choice (either or type question). Generally, each question shall test one course outcome (CO)

v. *Syllabus*: Each test shall cover 50% of the syllabus, approximately

THREE WEEK INDUCTION PROGRAM

Introduction

The graduating student must have knowledge and skills in the area of his study. However, he must also have broad understanding of society and relationships. Character needs to be nurtured as an essential quality by which he would understand and fulfil his responsibility as an engineer, a citizen and a human being. Besides the above, several meta-skills and underlying values are needed.

Induction Program

When new students enter an institution, they come with diverse thoughts, backgrounds and preparations. It is important to help them adjust to the new environment and inculcate in them the ethos of the institution with a sense of larger purpose.

We propose a 3-week long induction program for the UG students entering the institution, right at the start. Normal classes start only after the induction program is over. Its purpose is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.

The time during the Induction Program is also used to rectify some critical lacunas, for example, English background, for those students who have deficiency in it.

The following are the activities under the induction program in which the student would be fully engaged throughout the day for the entire duration of the program.

2.1 Physical Activity

This would involve a daily routine of physical activity with games and sports. It would start with all students coming to the field at 6 am for light physical exercise or yoga. There would also be games in the evening or at other suitable times according to the local climate. These would help develop team work. Each student should pick one game and learn it for three weeks. There could also be gardening or other suitably designed activity where labour yields fruits from nature.

2.2 Creative Arts

Every student would chose one skill related to the arts whether visual arts or performing arts. Examples are painting, music, dance etc. The student would pursue it everyday for the duration of the program.

These would allow for creative expression. It would develop a sense of aesthetics and also enhance creativity which would, hopefully, flow into engineering design later.

2.3 Universal Human Values

The teachers must come from all the departments rather than only one department like HSS or from outside of the Institute.

Discussions would be conducted in small groups of about 20 students with a faculty mentor each. It is to open thinking towards the self.

2.4 Literary

Literary activity would encompass reading, writing and possibly, debating, enacting a play etc.

2.5 Proficiency Modules

This period can be used to overcome some critical lacunas that students might have, for example, English, computer familiarity etc. These should run like crash courses.

2.6 Lectures by Eminent People

This period can be utilized for lectures by eminent people, say, once a week. It would give the students exposure to people who are socially active or in public life.

2.7 Visits to Local Area

A couple of visits to the landmarks of the city, or a hospital or orphanage could be organized. This would familiarize them with the area as well as expose them to the under privileged.

2.8 Familiarization to Dept. / Branch & Innovations

They should be told about what getting into a branch or department means what role it plays in society, through its technology. They should also be shown the laboratories, workshops & other facilities.

Annexure-1 Curriculum
For B. Tech (Civil Engineering)

First Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
	BSC	Mathematics - I	3	1	0	30	70	4
	BSC	Engineering Chemistry	3	1	0	30	70	4
	HSMC	English	2	0	0	30	70	2
	ESC	Programming for Problem Solving	3	0	0	30	70	3
	BSC	Chemistry Lab	0	0	3	50	50	1.5
	ESC	Programming for Problem Solving Lab	0	0	4	50	50	2
	HSMC	English Lab	0	0	2	50	50	1
		Total	11	2	9	270	430	17.5

Second Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
	BSC	Mathematics - II	3	1	0	30	70	4
	BSC	Engineering Physics	3	1	0	30	70	4
	ESC	Basic Electrical Engineering	3	1	0	30	70	4
	ESC	Engineering Graphics & Design	1	0	4	50	50	3
	BSC	Engineering Physics Lab	0	0	3	50	50	1.5
	ESC	Basic Electrical Engineering Lab	0	0	2	50	50	1
	ESC	Workshop and Manufacturing Practices	1	0	4	50	50	3
		Total	11	3	13	290	410	20.5

Annexure-1 Curriculum
For B. Tech (Mechanical Engineering)

First Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
	BSC	Mathematics - I	3	1	0	30	70	4
	BSC	Engineering Chemistry	3	1	0	30	70	4
	HSMC	English	2	0	0	30	70	2
	ESC	Programming for Problem Solving	3	0	0	30	70	3
	BSC	Chemistry Lab	0	0	3	50	50	1.5
	ESC	Programming for Problem Solving Lab	0	0	4	50	50	2
	HSMC	English Lab	0	0	2	50	50	1
		Total	11	2	9	270	430	17.5

Second Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
	BSC	Mathematics - II	3	1	0	30	70	4
	BSC	Engineering Physics	3	1	0	30	70	4
	ESC	Basic Electrical Engineering	3	1	0	30	70	4
	ESC	Engineering Graphics & Design	1	0	4	50	50	3
	BSC	Engineering Physics Lab	0	0	3	50	50	1.5
	ESC	Basic Electrical Engineering Lab	0	0	2	50	50	1
	ESC	Workshop and Manufacturing Practices	1	0	4	50	50	3
		Total	11	3	13	290	410	20.5

Annexure-1 Curriculum
For B. Tech (Electrical and Electronics Engineering)

First Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
	BSC	Mathematics - I	3	1	0	30	70	4
	BSC	Engineering Chemistry	3	1	0	30	70	4
	HSMC	English	2	0	0	30	70	2
	ESC	Programming for Problem Solving	3	0	0	30	70	3
	BSC	Chemistry Lab	0	0	3	50	50	1.5
	ESC	Programming for Problem Solving Lab	0	0	4	50	50	2
	HSMC	English Lab	0	0	2	50	50	1
		Total	11	2	9	270	430	17.5

Second Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
	BSC	Mathematics - II	3	1	0	30	70	4
	BSC	Engineering Physics	3	1	0	30	70	4
	ESC	Basic Electrical Engineering	3	1	0	30	70	4
	ESC	Engineering Graphics & Design	1	0	4	50	50	3
	BSC	Engineering Physics Lab	0	0	3	50	50	1.5
	ESC	Basic Electrical Engineering Lab	0	0	2	50	50	1
	ESC	Workshop and Manufacturing Practices	1	0	4	50	50	3
		Total	11	3	13	290	410	20.5

Annexure-1 Curriculum
For B. Tech (Electronics and Communication Engineering)

First Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
	BSC	Mathematics - I	3	1	0	30	70	4
	BSC	Engineering Physics	3	1	0	30	70	4
	ESC	Basic Electrical Engineering	3	1	0	30	70	4
	ESC	Engineering Graphics & Design	1	0	4	50	50	3
	BSC	Engineering Physics Lab	0	0	3	50	50	1.5
	ESC	Basic Electrical Engineering Lab	0	0	2	50	50	1
	ESC	Workshop and Manufacturing Practices	1	0	4	50	50	3
		Total	11	3	13	290	410	20.5

Second Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
	BSC	Mathematics - II	3	1	0	30	70	4
	BSC	Engineering Chemistry	3	1	0	30	70	4
	HSMC	English	2	0	0	30	70	2
	ESC	Programming for Problem Solving	3	0	0	30	70	3
	BSC	Chemistry Lab	0	0	3	50	50	1.5
	ESC	Programming for Problem Solving Lab	0	0	4	50	50	2
	HSMC	English Lab	0	0	2	50	50	1
		Total	11	2	9	270	430	17.5

Annexure-1 Curriculum
For B. Tech (Computer Science and Engineering)

First Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
	BSC	Mathematics - I	3	1	0	30	70	4
	BSC	Engineering Physics	3	1	0	30	70	4
	ESC	Basic Electrical Engineering	3	1	0	30	70	4
	ESC	Engineering Graphics & Design	1	0	4	50	50	3
	BSC	Engineering Physics Lab	0	0	3	50	50	1.5
	ESC	Basic Electrical Engineering Lab	0	0	2	50	50	1
	ESC	Workshop and Manufacturing Practices	1	0	4	50	50	3
		Total	11	3	13	290	410	20.5

Second Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
	BSC	Mathematics - II	3	1	0	30	70	4
	BSC	Engineering Chemistry	3	1	0	30	70	4
	HSMC	English	2	0	0	30	70	2
	ESC	Programming for Problem Solving	3	0	0	30	70	3
	BSC	Chemistry Lab	0	0	3	50	50	1.5
	ESC	Programming for Problem Solving Lab	0	0	4	50	50	2
	HSMC	English Lab	0	0	2	50	50	1
		Total	11	2	9	270	430	17.5

Note: The curriculum and syllabus for III to VIII Semesters will be ratified in subsequent Academic council/BOS meetings

Annexure-2 Syllabus

B. Tech I Semester Civil Engineering

MATHEMATICS – I

(Common to All Branches)

Scheme	: 2018			
Internal Assessment	: 30	L	T	C
End Exam	: 70	**3**	**1**	**4**

Objectives:

To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following:

The essential tool of matrices in a comprehensive manner.
The convergence of series.
Maximaand minima of a function and the radius of curvature
The Jacobians and extrema of a function.
Evaluate the definite integrals, Beta and Gamma functions. Apply Fourier series in engineering problems.

Unit I: **Matrices: (14 Hours)**

Basic definitions of Symmetric, skew-symmetric and orthogonal matrices– Elementary transformations – Rank – Echelon form, Normal form– System of linear equations –Eigen values and Eigen vectors for real matrices– Cayley-Hamilton theorem – Diagonalization of matrix by orthogonal transformation.

Unit II: **Sequences and series: (8Hours)**

Convergence of sequences and series – Comparison test – p test– D'Alemberts ratio test– Cauchy's root test. Power series – Series for exponential, trigonometricand logarithm functions.

Unit III: **Differential Calculus: (10Hours)**

Taylor's and Maclaurin's series – Maxima and minima of single variable –Curvature: Curvature of a curve – Curvature of a circle – Radius of a curvature – Centre of Curvature – Equation to the circle of curvature.

Unit IV: **Multivariable Calculus: (10Hours)**

Functions of two or more variables – Partial derivatives, Total derivative – Jacobians – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

Unit V: **Integral Calculus:(12Hours)**

Evaluation of definite integrals– Beta and Gamma functions and their properties. Fourier series: Half range Fourier sine and cosine expansions– Parseval's theorem.

Text Books:

Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-43 edition 2014.

Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 9th edition-2013.

Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9th Edition, Reprint, 2002.

Reference Books:

Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11th Edition, Reprint 2010.

Linear Algebra: A Modern Introduction, D Poole, 2nd Edition, Brooks/Cole, 2005.

A Text Book of Engineering Mathematics, N.P. Bali and Manish Goyal, Lakshmi Publications, Reprint 2008.

Course Outcomes:

On completion of course Students are able to

Apply the essential tool of matrices in a comprehensive manner.

Find the convergence of series.

Find the radius of curvature and maxima and minima of a function.

Find the Jacobians and extrema of a function.

Evaluation of definite integrals, Beta and Gamma functions. Application of Fourier series in engineering problems.

ENGINEERING CHEMISTRY

(Common to CE, ME, EEE- I SEM)

(Common to ECE & CSE - II SEM)

Objectives:

Knowledge in Chemistry serves as basic nutrient for the understanding and thereby design of materials of importance in life. Thus the advancement in Engineering depend on the outcome of basic sciences.

The Engineering Chemistry course for undergraduate students is framed to strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial! Engineering applications.

The course main aim is to impart in-depth knowledge of the subject and highlight the role of chemistry principles (or) applications in the field of engineering.

An attempt has been made to logically correlate the topic with its application.

After the completion of the course, the student would understand about the concepts of chemistry .

Module-1 : Atomic and molecular structure

Schrodinger wave equation. Particle in a box(one dimensional) and their applications .Molecular orbitals of diatomic molecules and plots of the multicenter orbitals. Equations for atomic and molecular orbitals. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.

Module-2: Periodic properties

Effective nuclear charge, penetration of orbitals, variations of s, p, d and f orbital energies of atoms in the periodic table, electronic configurations, atomic and ionic sizes,ionization energies, electron affinity and electronegativity, polarizability, oxidation states, coordination numbers and geometries, hard, soft acids and bases.

Module-3:

Intermolecular forces

Ionic, dipolar and van Der Waals interactions. Equations of state of real gases and critical phenomena.

Use of free energy in chemical equilibria

Thermodynamic functions: Introduction, define energy, entropy , Free energy.Free energy and emf.Cell potentials, the Nernst equation and applications.Water chemistry-types of water and Boiler troubles. Corrosion-types of corrosion and factors influencing corrosion.

Module-4: Spectroscopic techniques and applications

Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules.

Module-5:

Stereochemistry

Representations of 3 dimensional structures, structural isomers and stereoisomers,configurations and symmetry and chirality, enantiomers, diastereomers,optical activity,absolute configurations and conformational analysis of Cyclohexane.

Simple Organic Reactions

Introduction to reactions involving Substitution(SN^1 &SN^2), Addition Reactions involving C=C(Markonikoffreaction)&C=O(Grignardreagent),Elimination(E_1&E_2) Oxidation(Baeyer villiger reaction),Reduction(Clemmensen reduction).

Suggested Text Books

Engineering Chemistry, Satyaprakash, Khanna Book Publishing, Delhi

A Text Book of Engg. Chemistry, Shashi Chawla, Dhanpat Rai & Co. (P) Ltd.

3. . Essentials of Physical Chemistry, Bahl&Tuli, S.Chand Publishing

Applied Chemistry, Sunita Rattan, Kataria

Engineering Chemistry, Baskar, Wiley

6. . Engineering Chemistry – I, D. GrourKrishana, Vikas Publishing

7. . Laboratory Manual Engg. Chemistry, Anupma Rajput, Dhanpat Rai & Co.

Course Outcomes

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:

Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.Rationalise bulk properties and processes using thermodynamic considerations. Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques. Rationalise periodic properties such as ionization potential, electronegativity,oxidation states and electronegativity.
List major chemical reactions that are used in the synthesis of molecules.

ENGLISH

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Vocabulary Building

1.1 The concept of Word Formation

1.2 Root word from foreign languages and their use in English

1.3 Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives

1.4 Synonyms, antonyms

1.5 Idioms and phrases.

Basic Writing Skills

2.1 Sentence Structures

2.2 Use of phrases and clauses in sentences

2.3 Importance of proper punctuation

2.4 Creating coherence

2.5 Organizing principles of paragraphs in documents

2.6 Techniques for writing precisely

Transformation

3.1 Interchange of parts of speech

3.2 Active voice and Passive voice

3.3 Direct and Indirect speech

3.4 3.4Degrees of comparison

3.5 3.5Simple, compound and complex sentences

Identifying Common Errors in Writing

4.1 Subject-Verb agreement

4.2 Noun-pronoun agreement

4.3 Misplaced modifiers

4.4 Articles

4.5 Prepositions

4.6 Redundancies

4.7 Clichés

4.8 Tenses

Reading and Writing Practices

5.1 Comprehension

5.2 Précis Writing

5.3 Essay writing

5.4 Essay writing

PROGRAMMING FOR PROBLEM SOLVING

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Course Objectives

The course aims to provide exposure to problem-solving through programming
It aims to train the student to the basic concepts of the C programming language

Course Outcomes

The student will learn

To formulate simple algorithms for arithmetic and logical problems and to translate the algorithms to programs (in C language).
Choose the loops and decision making statements to solve the problem.
To implement different Operations on arrays.
To use functions to solve the given problem.
To understand structures, unions and pointers,

UNIT 1:

Introduction to Computers: - Introduction, computer hardware and software, creating and running programs, software development life cycle, algorithms, flowcharts.

Introduction to C programming: - Overview of C, structure of a C program, variables, constants, data types, identifiers, keywords, Input/output statements in C, programming examples.

UNIT 2:

Operators and Expressions:- Operators, expressions, precedence and associativity, evaluating expressions, type conversion, typedef, enumerations.

Decision making statements:if statement, if-else statement, nested if-else statement, switch statement.

Loops in C: while loop, for loop, do-while loop, nested for loops,

Jumping statements:break, continue and goto statements.

UNIT 3:

Arrays: Introduction, Declaration and initialization of 1D and 2D arrays.

Array applications: -bubble (exchange) sort, selection sort, linear search, binary search.

Strings: -Definition, declaration and initialization of strings, string I/O functions,string handling functions,array of strings (table of strings).

UNIT 4:

Functions: introduction, category of functions, parameter passing methods, storageclasses, recursivefunction.

Pointers: Understandingpointers, declaring and initialization of pointer variable, accessing the address of variables, accessing a variable through its pointer, chain of pointers.

UNIT 5:

Structures and union: Introduction, defining a structure, declaring structure variable, structure initialization, accessing members of structure, copying and comparing structure variables, structures within structures, array of structures, and introduction of union.

TEXT BOOKS

E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGraw Hill.
Rema Theraja, Programming in C, second edition, Oxford.

REFERENCE TEXT BOOKS

Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
R.G. Dromey, How to solve it by Computer, Pearson.
Yashavant Kanetkar, Let us C, 15th edition, BPB Publications.
Dr. P. ChennaReddy, Computer Fundamentals and C Programming, Second Edition.

CHEMISTRY LAB

(Common to CE, ME, EEE- I SEM)

(Common to ECE & CSE - II SEM)

Choice of experiments from the following:

1.Estimation of Hardness of Water present in given water sample by EDTA method.

Determination of surface tension and viscosity.

3. Determination of chloride content of water.

4.Colligative properties using freezing point depression.

5.Estimation of Dissolved Oxygen present in given water sample by Winkler's method.

6.Potentiometry - determination of Redox potentials and emfs.

7.Synthesis of a polymer/drug.

8.Saponification/acid value of an oil.

Determination of cell constant and conductance of solutions.. 10.Chemical oscillations- Iodine clock reaction.

11.Determination of the partition coefficient of a substance between two immiscible liquids.

12. Adsorption of acetic acid by charcoal.

Laboratory Outcomes

The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering.

The students will learn to:

Estimate rate constants of reactions from concentration of reactants/products as a function of time. Measure molecular/system properties such as surface tension, viscosity,conductance of solutions, redox potentials, chloride content of water, etc.

- Synthesize a small drug molecule and analyse a salt sample.

PROGRAMMING FOR PROBLEM SOLVING LAB

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Laboratory Objectives

To impart knowledge so that the student will

know how to write and debug programs

know the principles of designing structured programs

Know when and how to use the appropriate statements available in the C language.

Write basic C programs using, Selection statements, Repetitive statements, Functions, Pointers, Arrays, Strings and structures

Laboratory Outcomes

To formulate the algorithms for simple problems

To translate given algorithms to a working and correct program

To be able to correct syntax errors as reported by the compilers

To be able to identify and correct logical errors encountered at run time

To be able to write iterative as well as recursive programs

To be able to represent data in arrays, strings and structures and manipulate them through a program

To be able to create, read and write to and from simple text files.

The student is expected to solve at least 12 assignments from different concepts. (Every year 12 different experiments).

DOS commands, Algorithms, Flowcharts and sample C programs

Practice DOS commands necessary for design of C programs.

Design and develop algorithms and flowcharts for simple and logical problems

If the total selling price of 15 items and total profit earned on them is input through the keyboard. Write a C program to find the cost price of one item.

Ramesh‘s basic salary is input through the keyboard. His dearness allowance is 40% of basic salary and house rent allowance is 20% of basic salary. Write a C program to calculate his gross salary.

The distance between two cities (in km) is input through the keyboard. Write a C program to convert and print the distance in meters, centimetres, inches and feet.

Write a program to take input of name, roll no and marks obtained by a student in 5 subjects each have its 100 full marks and display the name, roll no with percentage score secured.

Problems involving if-then-else structures

Write a C program to find out whether a given number is even number or odd number.

Write a C program to check whether a given year is leap year or not.

Design and develop an algorithm that takes three coefficients (***a***, ***b***, and ***c***) of a Quadratic equation ($ax^2+bx+c=0$) as input and compute all possible roots. Implement a C program for the developed algorithm and execute the same to output the possible roots for a given set of coefficients with appropriate messages.

If the ages of the Ramesh, Suresh and Mahesh are input through the keyboard, write a C program to determine youngest of the three.

A character is entered through keyboard. Write a C program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol using if-else and switch case. The following table shows the range of ASCII values for various characters.

Characters	**ASCII values**
A – Z	65 – 90
a – z	97 – 122
0 – 9	48 – 57
Special symbols	0 – 47, 58 – 64, 91 – 96, 123 – 127.

A library charges fine for every book returned late. For first five days the fine is 50 paisa, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a C program to accept the number of days that the member is late to return the book and display the fine or appropriate message.

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).

Problems involving Looping statements

If the sum of the cubes of each digit of a number is equal to the number itself, then the number is called Armstrong number. (for example, $153 = 1^3+5^3+3^3$). Design and develop an algorithm to find whether a given number is Armstrong number or not. Implement a C program for the developed algorithm.

Design and develop an algorithm to find the square root of a given number ***N***. Implement a C program for the same and execute for all possible inputs with appropriate messages. Note: **Don't use library function *sqrt(n)*.**

If a number and its reversed number are same then the number is called as palindrome number. Design and develop an algorithm to check whether a given number is palindrome or not. Implement a C program for the same.

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

Write a C program to evaluate the sin(x) function series

$$= \quad \frac{}{} - \frac{}{} + \frac{}{} - \frac{}{} + \cdots$$

Fibonacci Sequence

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 program to generate the first N terms of the sequence.

Arrays

Write a C program to find the smallest and largest number in a given array.

Write a C program to find the frequency of a particular number in a list of integers.

Write a C program to sort the list of elements using

a) Bubble Sort b) Selection sort.

Write a C program to search for an element in a list of elements using

a) Linear search b) Binary search

Write a C program to find the transpose of a matrix.

Write a C program to read two matrices and perform the following operations

Addition of two matrices

Multiplication of two matrices

Additional Problems on arrays

Partitioning an array

Given a randomly ordered array of n elements, write a C program to partition the elements into two subsets such that elements $\leq X$ are in one subset and elements $\geq X$ are in another subset.

Finding the k^{th} smallest element

Given a randomly ordered array of n elements, write a C program to determine the k^{th} smallest element.

Array order reversal

Write a C program to rearrange the elements in an array so that they appear in reverse order.

Strings

If a string and its reversed string are same then the string is called as palindrome string. Design and develop an algorithm to check whether a given string is a palindrome or not and implement a C program for the same.

Write a C program to sort the names of students in a class in alphabetical order.

Additional Problems on strings

Write a C program to read two strings and perform the following operations without using built string library functions.

String length

String reversing

Comparison of two strings

Concatenation of two strings

Write a C program to count the number of vowels, consonants, digits, blank spaces and special characters in a given string.

Functions and Recursion

Write a C program to swap the contents of two variables using

Call by value

Call by reference.

Write a C program using recursion to

Find the factorial of a given number

Print the Fibonacci series up to a given number.

Find the GCD of two integers.

Structures

Write a C program to define a structure with the following members.

Roll No., Name, marks in Sub1, Sub2, Sub3. Read the n students records and find the total marks of each student and print the result in the following format.

Roll No	Name	Sub1	Sub2	Sub3	Total marks	result
189Y1A0501	Kavya	80	70	75	225	Distinction

Files

Write a C program to copy the contents of one file to another file.

TEXT BOOKS

Yashavant Kanetkar, Let us C, 15th edition, BPB publications.

E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGraw Hill.

R.G. Dromey, How to solve it by Computer, Pearson.

ENGLISH LAB

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Oral Communication

(This unit involve interactive practice sessions in Language Lab)

- Listening Comprehension ----- Language Lab
- Pronunciation, Intonation, Stress and Rhythm ----- Language Lab

Common Everyday Situations: Conversations and Dialogues ------ Communication Lab

Communication at workplace ------ Communication Lab

- Interviews ------ Communication Lab
- Formal Presentations ------ Communication Lab

B. Tech II Semester Civil Engineering

MATHEMATICS-II

(Common to All Branches)

Scheme	: 2018			
Internal Assessment	: 30	L	T	C
End Exam	: 70	**3**	**1**	**4**

Objectives:

To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following:

First order differential equations.
Linear differential equations with constant coefficients.
Laplace transforms in engineering problems.
Evaluate multiple integrals.
Understand Vector Calculus concepts and their applications.

Unit I: **First order ordinary differential equations:(10 Hours)**

Linear, Bernoulli equations, Exact and equations reducible to Exact. Applications: Orthogonal trajectories, Newton's law of cooling, Law of natural growth and decay.

Unit II: **Ordinary differential equations of higher order: (10Hours)**

Linear differential equations of second and higher order with constant coefficients – R.H.S term of the type e^{ax}, sinax, cosax, polynomials in x, e^{ax} V(x), xV(x) – Method of variation of parameters.

***Unit III*:Laplace transforms**: **(12Hours)**

Laplace transforms of standard functions – Properties of Laplace Transforms – Transforms of derivatives and integrals– Evaluation of integrals by Laplace transforms – Laplace transform of periodic functions. Convolution theorem. Inverse Laplace Transforms – Applications of Laplace transforms to ordinary differential equations.

Unit IV: **Multiple Integrals**:**(10Hours)**

Evaluation of double integrals in Cartesian coordinates and polar coordinates – Change of variables in double integrals – Change the order of integration in double integrals – Evaluation of triple integrals in Cartesian and polar coordinates – Change of variables in triple integrals.

Unit V: Vector calculus: (12Hours)

Vector differentiation: Scalar point function - Vector point function – Vector operator Del – Gradient – Divergence – Curl. Vector integration: Line, Surface and Volume integrals. Green's theorem in a plane, Stoke's theorem and Gauss-divergence theorems (Statements only). Applications of Green's, Stoke's and Gauss divergence theorems.

Text Books:

Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-43 edition 2014.

Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 9th edition-2013

Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9th Edition, Reprint, 2002.

Reference Books:

Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11th Edition, Reprint 2010.

A Text Book of Engineering Mathematics, N.P. Bali and Manish Goyal, Lakshmi Publications, Reprint 2008.

Outcomes:

On completion of course Students are able to

Solve the first order differential equations.

Solve linear differential equations with constant coefficients.

Apply Laplace Transforms in engineering problems.

Evaluation of multiple integrals.

Understand Vector Calculus concepts and their applications.

ENGINEERING PHYSICS

(Physics for CE)

LTPC

3 1 04

Prerequisite: Plus two level physics course

Course Description:

Physics for Civil Engineersis a physics course which provides fundamental knowledge to understand the concepts of interference, diffraction, lasers,mechanics, solids and Semicondoctors.

Course Objectives:

Expose students to theoretical and mathematical aspects of interference and diffraction of light for testing of materials.

Expose the importance of Mechanics of particles & Rigid body.

Expose students to the fundamental principles and laws of mechanics in Physics to understand the types of motion.

4. Develop knowledge and understanding the fundamental concepts of Solids and semiconductors.
5. Adaptability to new developments in science and technology.

Course Syllabus:

Unit I: Interference & Diffraction

Introduction to Interference,Interference in thin film by reflection, Newton‘s rings experiment, Diffraction, Farunhofer diffraction due to single slit, double slit and Diffraction grating (N-slit),Grating Spectrum, Applications of Diffraction.

(10 lectures)

UnitII: Lasers

Introduction to lasers, characteristics of laser, interaction of radiation with matter-spontaneous and stimulated emission, Einstein‘s coefficients; population inversion, excitation mechanisms, types of lasers: Solid-state lasers – Nd-YAG laser, Gas lasers - He-Ne Laser, Semiconductor p-n junction diode laser, Applications of lasers

(08 lectures)

Unit III:Mechanics of particles

Velocity and Acceleration, Motion in one dimension, several dimensions, formal solution of kinematical equations. Polar Co-ordinates, velocity and acceleration in polar coordinates. Newton‘s Laws, applications of Newton‘s laws. Conservative and non-conservative forces.

(08 lectures)

UnitIV: Rigid body Mechanics

Definition and motion of a rigid body in the plane, Rotation in the plane, Kinematics in a coordinate system rotating and translating in the plane; Angular momentum about a point of a rigid body in planar motion; Euler‘s laws of motion, their independence from Newton‘s laws, and their necessity in describing rigid body motion; Examples;

(08 lectures)

UnitV: Solids &Semiconductors

Introduction to solids and semiconductors. Free electron theory of metals (drift velocity and electrical conductivity), Fermi energy level, Kronig-Penney model and origin of energy bands, band structure of metals, semiconductors, and insulators. Direct and indirect bandgap semiconductors, Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), diffusion and drift, p -n junction.

(12 lectures)

Course Outcomes:

Upon successful completion of this course, the students should be able to:

- Define and evaluate the fundamentals of materials testing using Interference and Diffraction techniques.
- Identify the working elements of different lasers and estimate laser operation parameters.
- Describe and explain the fundamental physical principles and laws of Mechanics in Physics.
- Explain the role of semiconductors in different realms of physics and their applications in both science and technology.

Text Books:

Theory of Vibrations with Applications — WT Thomson.

Engineering Physics by **K. Thygarajan**, Mac Graw – Hill Publishing Co. New Delhi.

Reference books:

Engineering Mechanics - Dynamics, 7th ed. - JL Meriam.

An Introduction to Mechanics — D Kleppner & R Kolenkow.

BASIC ELECTRICAL ENGINEERING

(Common to CE, ME – II SEM)
(Common to ECE,CSE- I SEM)

UNIT 1: DC Circuits (8 hours)

Electrical circuit elements (R, L and C), voltage and current sources – source transformation, Series & Parallel networks - Star-Delta transformation, Kirchoff's current and voltage laws, Mesh and Nodal analysis of simple circuits with DC -Problems.

UNIT 2: AC Circuits (8 hours)

Representation of sinusoidal waveforms, average, peak and rms values, Form factor Peak factor for sinusoidalwave form -Problems

Phasor-Phasor representation, Impedance, Admittance, Reactance, Susceptance, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits forseries & parallel combinations –simple Problems

UNIT 3: DC machines (8 hours)

DC Generators: Construction– working principle – EMF equation – types of DC generators- applications - simple problems.

Working Principle of DC motor, types, Torque Equation, Concept of Back EMF-applications - simple Problems.

UNIT 4: Transformers & Induction Machines (8 hours)

Single Phase Transformers: Principle of Operation, Constructional details, EMF equation, losses in transformers, regulation and efficiency,equivalent circuit - simple Problems.

Three phase Induction Motor: Construction and working principle, slip, rotor frequency, rotor current, and rotor power factor –simple Problems

UNIT 5: Electrical Installations (6 hours)

Components of LT Switchgear: Switch Fuse Unit (SFU), Miniature Circuit Breaker (MCB), Wires and Cables, Earthing. Batteries, Introduction to power converters.

Suggested Text / Reference Books

D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 2010.

D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill, 2009.

L. S. Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press, 2011.

E. Hughes, “Electrical and Electronics Technology”, Pearson, 2010.

V. D. Toro, “Electrical Engineering Fundamentals”, Prentice Hall India, 1989.

A. Chakarabarthi “Circuit Theory”, Dhanapath Roy & Co

Electrical Circuits – N. Sreenivasulu – Reem Publications

ENGINEERING GRAPHICS & DESIGN

(Common to CE, ME, EEE- II SEM)
(Common to ECE & CSE - I SEM)

Detailed contents:

Traditional Engineering Graphics:

Principles of Engineering Graphics; Orthographic Projection; Descriptive Geometry; Drawing Principles; Isometric Projection; Surface Development; Perspective; Reading a Drawing; Sectional Views; Dimensioning & Tolerances; True Length, Angle; intersection, Shortest Distance.

Computer Graphics:

Engineering Graphics Software; -Spatial Transformations; Orthographic Projections; Model Viewing; Co-ordinate Systems; Multi-view Projection; Exploded Assembly; Model Viewing; Animation; Spatial Manipulation; Surface Modeling; Solid Modeling; Introduction to Building Information Modeling (BIM)

(Except the basic essential concepts, most of the teaching part can happen concurrently in the laboratory)

Module 1: Overview of Computer Graphics

Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.

Module 2: Customization & CAD Drawing

Consisting of set up of the drawing page and the printer, including scale settings, Setting up of units and drawing limits; ISO and ANSI standards for coordinate dimensioning; Orthographic constraints, Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines, Applying various ways of drawing circles;

Module 3: Introduction to Engineering drawing

Principles of Engineering Graphics and their significance, usage of Drawing instruments, Conic sections including the Rectangular Hyperbola (General method only); Cycloid, Epicycloid, Hypocycloid and Involute.

Module 4: Orthographic Projections

Principles of Orthographic Projections-Conventions - Projections of Points and lines inclined to both planes; Projections of planes inclined Planes

Module 5: Projections of Regular Solids
Projections of solids inclined to both planes.
Floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, etc.

Module 6: Sections and Sectional Views of Right Angular Solids Sections of Prism, Cylinder, Pyramid and Cone
Development of surfaces of Right Regular Prism, Pyramid, Cylinder and Cone

Module 7: Isometric Projections
Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions;

Module 8: Annotations, layering & other functions
Applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines (extend/lengthen); Printing documents to paper using the print command; orthographic projection techniques.

Suggested Text/Reference Books:

Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House

Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education

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

(Corresponding set of) CAD Software Theory and User Manuals

Course Outcomes

The student will learn:

Introduction to engineering design and its place in society
Exposure to the visual aspects of engineering design
Exposure to engineering graphics standards
Exposure to solid modeling
Exposure to computer-aided geometric design
Exposure to creating working drawings
Exposure to engineering communication

ENGINEERING PHYSICS LAB

(Common to CE, ME, EEE- II SEM)

(Common to ECE & CSE - I SEM)

Course Description:

Physics Practical course is meant for making the students to gain practical knowledge to co relate with the theoretical studies. It covers experiments on Principles of Mechanics and Optics, Measurement of Magnetic field and studying Resonance using LCR Circuit.

Objectives:-

To explore the application of interference and diffraction by doing concerned experiments.
Elucidate the concepts of Physics through involvement in the experiment by applying theoretical knowledge.
Develop an ability to apply the knowledge of physics experiments in the later studies.
To understand the concept of energy gap, B-H curve, and synthesis of nano material by performing the experiments**.**

LIST OF EXPERIMENTS

Any 7 of the following experiments has to be performed in a semester:

Determination of wavelengths of various colours of mercury spectrum using diffraction grating in normal incidence method.
Determination of dispersive power of the prism.
Rigidity Modulus- Torsonal Pendulum.
Study of resonance effect in series and parallel LCR circuit.
Determination of thickness of thin object by wedge method.
Determination of radius of curvature of lens by Newton's Rings.
Laser : Determination of wavelength using diffraction grating.
Energy gap of a semiconductor using p-n junction diode.
Hysteresis: B-H curve.
Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
Frequency of the tuning fork - Melde's apparatus.
Spring constant - Coupled Pendulums.

Course Outcomes:

Upon successful completion of this course, the students should be able to:

Students can aware of the application of interference, diffraction phenomena along with laser.
Apply the scientific process in the conduct and reporting of experimental investigations.
Understand measurement technology, usage of new instruments and real time applications in engineering studies.
Verify the theoretical ideas and concepts covered in lecture by doing hands on in the experiments.
Know about the characteristics of various materials in a practical manner and gain knowledge about various optical technique methods.
Acquire and interpret experimental data to examine the physical laws.

Lab Manual: Laboratory Manual for Engineering Physics.

Mode of Evaluation: Continuous Internal Evaluation, Practical End Examination.

BASIC ELECTRICAL ENGINEERING LAB

(Common to CE,ME – II SEM)

(Common to ECE, CSE – I SEM)

List of Laboratory Experiments/Demonstrations:

Basic safety precautions. Introduction and use of measuring instruments – Voltmeter. Ammeter, Wattmeter, Multi-meter and oscilloscope.

Determination of values of R, L and C parameters of a given R-L-C series circuit

Verification of KCL and KVL.

Determination of Active, reactive and apparent power for R-L circuit (series & parallel).

Determination of Active, reactive and apparent power for R-C circuit (series & parallel).

Load test on 1-phase transformer.

OC & SC tests on 1-phase transformer to obtain equivalent circuit.

Torque-speed characteristics of DC shunt motor.

Speed Control of three –phase induction motors using pole changing method

Demonstration of cut out sections of DC & AC machines

Study of fuse, MCB, Batteries

WORKSHOP AND MANUFACTURING PRACTICES

(Common to CE, ME, EEE- II SEM)
(Common to ECE & CSE - I SEM)

Lectures & videos: (10 hours)

Detailed contents

Manufacturing Methods- casting, forming, machining, joining, advanced manufacturing methods **(3 lectures)**

CNC machining and Additive manufacturing **(1 lecture)**

Fitting operations & power tools **(1 lecture)**

Electrical &Electronics **(1 lecture)**

Carpentry **(1 lecture)**

Plastic molding, glass cutting **(1 lecture)**

Metal casting **(1 lecture)**

Welding (arc welding & gas welding) and brazing **(1 lecture)**

Text/Reference Books:

Hajra Choudhury S.K., Hajra Choudhury 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.

(Kalpakjian S. And Steven S. Schmid, ―Manufacturing Engineering and Technology‖, 4th edition, Pearson Education India Edition, 2002.

Gowri P. Hariharan and A. Suresh Babu,‖Manufacturing Technology – I‖ Pearson Education, 2008.

Roy A. Lindberg, ―Processes and Materials of Manufacture‖, 4th edition, Prentice Hall India, 1998.

Rao P.N., ―Manufacturing Technology‖, Vol. I and Vol. II, Tata McGrawHill House, 2017.

Course Outcomes:

Upon completion of this course

The students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.

Workshop Practice:(60 hours)

Machine shop (10 hours)

Fitting shop (8 hours)

Carpentry (6 hours)

Electrical (8 hours)

Welding shop (8 hours (Arc welding 4 hrs + gas welding 4 hrs)
Casting (8 hours)
Tin Smithy (6 hours)
Examinations could involve the actual fabrication of simple components, utilizing one or more of the techniques covered above.

S.NO	EXPERIMENTS IN THE SYLLABUS
	MACHINE SHOP
1	STEP TURNING OPERATION
2	TAPER TURNING OPERATION
	FITTING SECTION
1	SQUARE FITTING
2	STEEPED FITTING
	CARPENTRY SECTION
1	TEE HALVING JOINT
2	DOVETAIL TEE HALVING JOINT
	HOUSE WIRING SECTION
1	TO CONTROL TWO LAMPS BY ONE SINGLE WAY SWITCH(IN SERIES)
2	TO CONTROL TWO LAMPS BY ONE SINGLE WAY SWITCH(PARALLEL)
	WELDING SECTION
1	SINGLE V BUTT JOINT
2	LAP JOINT
	FOUNDRY SECTION
1	SINGLE PIECE SQUARE PATTERN
2	SINGLE PIECE ROUND PATTERN
	SHEETMETAL SECTION
1	SQUARE TRY
2	CYLINDER

Laboratory Outcomes:

Upon completion of this laboratory course, students will be able to fabricate components with their own hands.

They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.

By assembling different components, they will be able to produce small devices of their interest.

B. Tech I Semester Electrical & Electronics Engineering

MATHEMATICS – I

(Common to All Branches)

Scheme	: 2018			
Internal Assessment	: 30	L	T	C
End Exam	: 70	**3**	**1**	**4**

Objectives:

To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following:

The essential tool of matrices in a comprehensive manner.
The convergence of series.
Maximaand minima of a function and the radius of curvature
The Jacobians and extrema of a function.
Evaluate the definite integrals, Beta and Gamma functions. Apply Fourier series in engineering problems.

Unit I: **Matrices: (14 Hours)**

Basic definitions of Symmetric, skew-symmetric and orthogonal matrices– Elementary transformations – Rank – Echelon form, Normal form– System of linear equations –Eigen values and Eigen vectors for real matrices– Cayley-Hamilton theorem – Diagonalization of matrix by orthogonal transformation.

Unit II: **Sequences and series: (8Hours)**

Convergence of sequences and series – Comparison test – p test– D'Alemberts ratio test– Cauchy's root test. Power series – Series for exponential, trigonometricand logarithm functions.

Unit III: **Differential Calculus: (10Hours)**

Taylor's and Maclaurin's series – Maxima and minima of single variable –Curvature: Curvature of a curve – Curvature of a circle – Radius of a curvature – Centre of Curvature – Equation to the circle of curvature.

Unit IV: **Multivariable Calculus: (10Hours)**

Functions of two or more variables – Partial derivatives, Total derivative – Jacobians – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

Unit V: **Integral Calculus:(12Hours)**

Evaluation of definite integrals– Beta and Gamma functions and their properties. Fourier series: Half range Fourier sine and cosine expansions– Parseval's theorem.

Text Books:

Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-43 edition 2014.

Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 9th edition- 2013.

Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9th Edition, Reprint, 2002.

Reference Books:

Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11th Edition, Reprint 2010.

Linear Algebra: A Modern Introduction, D Poole, 2nd Edition, Brooks/Cole, 2005.

A Text Book of Engineering Mathematics, N.P. Bali and Manish Goyal, Lakshmi Publications, Reprint 2008.

Course Outcomes:

On completion of course Students are able to

Apply the essential tool of matrices in a comprehensive manner.

Find the convergence of series.

Find the radius of curvature and maxima and minima of a function.

Find the Jacobians and extrema of a function.

Evaluation of definite integrals, Beta and Gamma functions. Application of Fourier series in engineering problems.

ENGINEERING CHEMISTRY

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Objectives:

Knowledge in Chemistry serves as basic nutrient for the understanding and thereby design of materials of importance in life. Thus the advancement in Engineering depend on the outcome of basic sciences.

The Engineering Chemistry course for undergraduate students is framed to strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial! Engineering applications.

The course main aim is to impart in-depth knowledge of the subject and highlight the role of chemistry principles (or) applications in the field of engineering.

An attempt has been made to logically correlate the topic with its application.

After the completion of the course, the student would understand about the concepts of chemistry .

Module-1 : Atomic and molecular structure

Schrodinger wave equation. Particle in a box(one dimensional) and their applications .Molecular orbitals of diatomic molecules and plots of the multicenter orbitals. Equations for atomic and molecular orbitals. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.

Module-2: Periodic properties

Effective nuclear charge, penetration of orbitals, variations of s, p, d and f orbital energies of atoms in the periodic table, electronic configurations, atomic and ionic sizes,ionization energies, electron affinity and electronegativity, polarizability, oxidation states, coordination numbers and geometries, hard, soft acids and bases.

Module-3:

Intermolecular forces

Ionic, dipolar and van Der Waals interactions. Equations of state of real gases and critical phenomena.

Use of free energy in chemical equilibria

Thermodynamic functions: Introduction, define energy, entropy , Free energy.Free energy and emf.Cell potentials, the Nernst equation and applications.Water chemistry-types of water and Boiler troubles. Corrosion-types of corrosion and factors influencing corrosion.

Module-4: Spectroscopic techniques and applications

Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules.

Module-5:

Stereochemistry

Representations of 3 dimensional structures, structural isomers and stereoisomers,configurations and symmetry and chirality, enantiomers, diastereomers,optical activity,absolute configurations and conformational analysis of Cyclohexane.

Simple Organic Reactions

Introduction to reactions involving Substitution(SN^1 &SN^2), Addition Reactions involving C=C(Markonikoffreaction)&C=O(Grignardreagent),Elimination(E_1&E_2) Oxidation(Baeyer villiger reaction),Reduction(Clemmensen reduction).

Suggested Text Books

1. Engineering Chemistry, Satyaprakash, Khanna Book Publishing, Delhi
2. A Text Book of Engg. Chemistry, Shashi Chawla, Dhanpat Rai & Co. (P) Ltd.

Essentials of Physical Chemistry, Bahl&Tuli, S.Chand Publishing

Applied Chemistry, Sunita Rattan, Kataria

Engineering Chemistry, Baskar, Wiley

6. . Engineering Chemistry – I, D. GrourKrishana, Vikas Publishing

7. . Laboratory Manual Engg. Chemistry, Anupma Rajput, Dhanpat Rai & Co.

Course Outcomes

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:

Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.Rationalise bulk properties and processes using thermodynamic considerations. Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques. Rationalise periodic properties such as ionization potential, electronegativity,oxidation states and electronegativity.
List major chemical reactions that are used in the synthesis of molecules.

ENGLISH

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Vocabulary Building

1.1 The concept of Word Formation
1.2 Root word from foreign languages and their use in English
1.3 Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives
1.4 Synonyms, antonyms
1.5 Idioms and phrases.

Basic Writing Skills

2.1 Sentence Structures
2.2 Use of phrases and clauses in sentences
2.3 Importance of proper punctuation
2.4 Creating coherence
2.5 Organizing principles of paragraphs in documents
2.6 Techniques for writing precisely

Transformation

3.1 Interchange of parts of speech
3.2 Active voice and Passive voice
3.3 Direct and Indirect speech
3.4 3.4Degrees of comparison
3.5 3.5Simple, compound and complex sentences

Identifying Common Errors in Writing 4.1

Subject-Verb agreement
4.2 Noun-pronoun agreement
4.3 Misplaced modifiers
4.4 Articles
4.5 Prepositions
4.6 Redundancies
4.7 Clichés
4.8 Tenses

Reading and Writing Practices

5.1 Comprehension
5.2 Précis Writing
5.3 Essay writing
5.4 Essay writing

PROGRAMMING FOR PROBLEM SOLVING

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Course Objectives

The course aims to provide exposure to problem-solving through programming
It aims to train the student to the basic concepts of the C programming language

Course Outcomes

The student will learn

To formulate simple algorithms for arithmetic and logical problems and to translate the algorithms to programs (in C language).
Choose the loops and decision making statements to solve the problem.
To implement different Operations on arrays.
To use functions to solve the given problem.
To understand structures, unions and pointers,

UNIT 1:

Introduction to Computers: - Introduction, computer hardware and software, creating and running programs, software development life cycle, algorithms, flowcharts.

Introduction to C programming: - Overview of C, structure of a C program, variables, constants, data types, identifiers, keywords, Input/output statements in C, programming examples.

UNIT 2:

Operators and Expressions:- Operators, expressions, precedence and associativity, evaluating expressions, type conversion, typedef, enumerations.

Decision making statements:if statement, if-else statement, nested if-else statement, switch statement.

Loops in C: while loop, for loop, do-while loop, nested for loops,

Jumping statements:break, continue and goto statements.

UNIT 3:

Arrays: Introduction, Declaration and initialization of 1D and 2D arrays.

Array applications: -bubble (exchange) sort, selection sort, linear search, binary search.

Strings: -Definition, declaration and initialization of strings, string I/O functions,string handling functions,array of strings (table of strings).

UNIT 4:

Functions: introduction, category of functions, parameter passing methods, storageclasses, recursivefunction.

Pointers: Understandingpointers, declaring and initialization of pointer variable, accessing the address of variables, accessing a variable through its pointer, chain of pointers.

UNIT 5:

Structures and union: Introduction, defining a structure, declaring structure variable, structure initialization, accessing members of structure, copying and comparing structure variables, structures within structures, array of structures, and introduction of union.

TEXT BOOKS

E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGraw Hill.
Rema Theraja, Programming in C, second edition, Oxford.

REFERENCE TEXT BOOKS

Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
R.G. Dromey, How to solve it by Computer, Pearson.
Yashavant Kanetkar, Let us C, 15th edition, BPB Publications.
Dr. P. ChennaReddy, Computer Fundamentals and C Programming, Second Edition.

CHEMISTRY LAB

(Common to CE, ME, EEE- I SEM)

(Common to ECE & CSE - II SEM)

Choice of experiments from the following:

1.Estimation of Hardness of Water present in given water sample by EDTA method.

Determination of surface tension and viscosity.

3. Determination of chloride content of water.

4.Colligative properties using freezing point depression.

5.Estimation of Dissolved Oxygen present in given water sample by Winkler's method.

6.Potentiometry - determination of Redox potentials and emfs.

7.Synthesis of a polymer/drug.

8.Saponification/acid value of an oil.

Determination of cell constant and conductance of solutions.. 10.Chemical oscillations- Iodine clock reaction.

11.Determination of the partition coefficient of a substance between two immiscible liquids.

12. Adsorption of acetic acid by charcoal.

Laboratory Outcomes

The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering.

The students will learn to:

Estimate rate constants of reactions from concentration of reactants/products as a function of time. Measure molecular/system properties such as surface tension, viscosity,conductance of solutions, redox potentials, chloride content of water, etc.

- Synthesize a small drug molecule and analyse a salt sample.

PROGRAMMING FOR PROBLEM SOLVING LAB

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Laboratory Objectives

To impart knowledge so that the student will

know how to write and debug programs

know the principles of designing structured programs

Know when and how to use the appropriate statements available in the C language.

Write basic C programs using, Selection statements, Repetitive statements, Functions, Pointers, Arrays, Strings and structures

Laboratory Outcomes

To formulate the algorithms for simple problems

To translate given algorithms to a working and correct program

To be able to correct syntax errors as reported by the compilers

To be able to identify and correct logical errors encountered at run time

To be able to write iterative as well as recursive programs

To be able to represent data in arrays, strings and structures and manipulate them through a program

To be able to create, read and write to and from simple text files.

The student is expected to solve at least 12 assignments from different concepts. (Every year 12 different experiments).

DOS commands, Algorithms, Flowcharts and sample C programs

Practice DOS commands necessary for design of C programs.

Design and develop algorithms and flowcharts for simple and logical problems

If the total selling price of 15 items and total profit earned on them is input through the keyboard. Write a C program to find the cost price of one item.

Ramesh‘s basic salary is input through the keyboard. His dearness allowance is 40% of basic salary and house rent allowance is 20% of basic salary. Write a C program to calculate his gross salary.

The distance between two cities (in km) is input through the keyboard. Write a C program to convert and print the distance in meters, centimetres, inches and feet.

Write a program to take input of name, roll no and marks obtained by a student in 5 subjects each have its 100 full marks and display the name, roll no with percentage score secured.

Problems involving if-then-else structures

Write a C program to find out whether a given number is even number or odd number.

Write a C program to check whether a given year is leap year or not.

Design and develop an algorithm that takes three coefficients (***a***, ***b***, and ***c***) of a Quadratic equation ($ax^2+bx+c=0$) as input and compute all possible roots. Implement a C program for the developed algorithm and execute the same to output the possible roots for a given set of coefficients with appropriate messages.

If the ages of the Ramesh, Suresh and Mahesh are input through the keyboard, write a C program to determine youngest of the three.

A character is entered through keyboard. Write a C program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol using if-else and switch case. The following table shows the range of ASCII values for various characters.

Characters	**ASCII values**
A – Z	65 – 90
a – z	97 – 122
0 – 9	48 – 57
Special symbols	0 – 47, 58 – 64, 91 – 96, 123 – 127.

A library charges fine for every book returned late. For first five days the fine is 50 paisa, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a C program to accept the number of days that the member is late to return the book and display the fine or appropriate message.

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).

Problems involving Looping statements

If the sum of the cubes of each digit of a number is equal to the number itself, then the number is called Armstrong number. (for example, $153 = 1^3+5^3+3^3$). Design and develop an algorithm to find whether a given number is Armstrong number or not. Implement a C program for the developed algorithm.

Design and develop an algorithm to find the square root of a given number ***N***. Implement a C program for the same and execute for all possible inputs with appropriate messages. Note: **Don't use library function *sqrt(n)*.**

If a number and its reversed number are same then the number is called as palindrome number. Design and develop an algorithm to check whether a given number is palindrome or not. Implement a C program for the same.

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

Write a C program to evaluate the sin(x) function series

$$= \quad \frac{}{} - \frac{}{} + \frac{}{} - \frac{}{} + \cdots$$

Fibonacci Sequence

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 program to generate the first N terms of the sequence.

Arrays

Write a C program to find the smallest and largest number in a given array.

Write a C program to find the frequency of a particular number in a list of integers.

Write a C program to sort the list of elements using
b) Bubble Sort b) Selection sort.

23. Write a C program to search for an element in a list of elements using
b) Linear search b) Binary search

24. Write a C program to find the transpose of a matrix.

Write a C program to read two matrices and perform the following operations

Addition of two matrices

Multiplication of two matrices

Additional Problems on arrays

Partitioning an array

Given a randomly ordered array of n elements, write a C program to partition the elements into two subsets such that elements $\leq X$ are in one subset and elements $\geq X$ are in another subset.

Finding the k^{th} smallest element

Given a randomly ordered array of n elements, write a C program to determine the k^{th} smallest element.

Array order reversal

Write a C program to rearrange the elements in an array so that they appear in reverse order.

Strings

If a string and its reversed string are same then the string is called as palindrome string. Design and develop an algorithm to check whether a given string is a palindrome or not and implement a C program for the same.

Write a C program to sort the names of students in a class in alphabetical order.

Additional Problems on strings

Write a C program to read two strings and perform the following operations without using built string library functions.

String length

String reversing

Comparison of two strings

Concatenation of two strings

Write a C program to count the number of vowels, consonants, digits, blank spaces and special characters in a given string.

Functions and Recursion

Write a C program to swap the contents of two variables using

Call by value

Call by reference.

Write a C program using recursion to

Find the factorial of a given number

Print the Fibonacci series up to a given number.

Find the GCD of two integers.

Structures

Write a C program to define a structure with the following members.

Roll No., Name, marks in Sub1, Sub2, Sub3. Read the n students records and find the total marks of each student and print the result in the following format.

Roll No	Name	Sub1	Sub2	Sub3	Total marks	result
189Y1A0501	Kavya	80	70	75	225	Distinction

Files

36. Write a C program to copy the contents of one file to another file.

TEXT BOOKS

Yashavant Kanetkar, Let us C, 15th edition, BPB publications.

E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGraw Hill.

R.G. Dromey, How to solve it by Computer, Pearson.

ENGLISH LAB

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Oral Communication

(This unit involve interactive practice sessions in Language Lab)

- Listening Comprehension ----- Language Lab
- Pronunciation, Intonation, Stress and Rhythm ----- Language Lab

Common Everyday Situations: Conversations and Dialogues ------ Communication Lab

Communication at workplace ------ Communication Lab

- Interviews ------ Communication Lab
- Formal Presentations ------ Communication Lab

B. Tech II Semester Electrical & Electronics Engineering

MATHEMATICS-II

(Common to All Branches)

Scheme	: 2018			
Internal Assessment	: 30	L	T	C
End Exam	: 70	**3**	**1**	**4**

Objectives:

To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following:

First order differential equations.
Linear differential equations with constant coefficients.
Laplace transforms in engineering problems.
Evaluate multiple integrals.
Understand Vector Calculus concepts and their applications.

Unit I: **First order ordinary differential equations:(10 Hours)**

Linear, Bernoulli equations, Exact and equations reducible to Exact. Applications: Orthogonal trajectories, Newton's law of cooling, Law of natural growth and decay.

Unit II: **Ordinary differential equations of higher order: (10Hours)**

Linear differential equations of second and higher order with constant coefficients – R.H.S term of the type e^{ax}, sinax, cosax, polynomials in x, e^{ax} V(x), xV(x) – Method of variation of parameters.

***Unit III*:Laplace transforms**: **(12Hours)**

Laplace transforms of standard functions – Properties of Laplace Transforms – Transforms of derivatives and integrals– Evaluation of integrals by Laplace transforms – Laplace transform of periodic functions. Convolution theorem. Inverse Laplace Transforms – Applications of Laplace transforms to ordinary differential equations.

Unit IV: **Multiple Integrals**:**(10Hours)**

Evaluation of double integrals in Cartesian coordinates and polar coordinates – Change of variables in double integrals – Change the order of integration in double integrals – Evaluation of triple integrals in Cartesian and polar coordinates – Change of variables in triple integrals.

Unit V: Vector calculus: (12Hours)

Vector differentiation: Scalar point function - Vector point function – Vector operator Del – Gradient – Divergence – Curl. Vector integration: Line, Surface and Volume integrals. Green's theorem in a plane, Stoke's theorem and Gauss-divergence theorems (Statements only). Applications of Green's, Stoke's and Gauss divergence theorems.

Text Books:

Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-43 edition 2014.

Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 9th edition-2013

Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9th Edition, Reprint, 2002.

Reference Books:

Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11th Edition, Reprint 2010.

A Text Book of Engineering Mathematics, N.P. Bali and Manish Goyal, Lakshmi Publications, Reprint 2008.

Outcomes:

On completion of course Students are able to

Solve the first order differential equations.

Solve linear differential equations with constant coefficients.

Apply Laplace Transforms in engineering problems.

Evaluation of multiple integrals.

Understand Vector Calculus concepts and their applications.

ENGINEERING PHYSICS

(Physics for EEE & ECE)

(Common to EEE- II SEM)
(Common to ECE- I SEM)

Prerequisite: Plus two level physics course

Course Description: Physics for Electrical and Computer Engineers isa basic physics course which provides fundamental knowledge to understand the concepts of Waves, Optics, Lasers, Quantum Mechanics, Solidsand Semiconductors.

Course Objectives:

Expose studentsin understanding the basic laws of nature through wave equationusing the principles of oscillations and waves.
Expose students to theoretical and mathematical aspects of Interference, Diffraction techniques and Lasers for testing of materials.
Develop knowledge and understanding the fundamental concepts of Quantum mechanics.
Develop knowledge and understanding the fundamental concepts of solids and semiconductors.
Adaptability to new developments in science and technology.

Course Syllabus:

Unit I:Waves

Introduction, Simple harmonic motion, Characteristics of Simple harmonic motion, Energy of Simple harmonic motion, Principle of Superposition of waves, Linear superposition of two waves of same frequency. Damped harmonic oscillations, Energy and power dissipations in Damped harmonic oscillations, forced harmonic oscillations, Resonance. (08 lectures)

Unit II: Wave Optics

Introduction, Huygens‘ Principle, Superposition of waves, Young‘s double slit experiment, expression for fringe width, interference in thin film by reflection, Newton‘s rings experiment, DiffractionFarunhofer diffraction due to single slit, and Diffraction grating (N-slits).
(10 lectures)

UnitIII: Lasers

Introduction to lasers, characteristics of laser, interaction of radiation with matter-spontaneous and stimulated emission, Einstein‘s coefficients; population inversion, excitation

mechanisms, types of lasers: Solid-state lasers – Nd-YAG laser, Gas lasers - He-Ne Laser, Semiconductor p-n junction diode laser, Applications of lasers

(08 lectures)

UnitIV: Quantum Mechanics& Wave Equations

Introduction, Wave nature of matter, Uncertainty principle, Time-dependent and time-independent Schrodinger equations for wave function, Physical significance of wave function, Schrodinger equation for one dimensional particle in a box.

(8 lectures)

UnitV: Solids &Semiconductors

Introduction, Free electron theory of metals (drift velocity and electrical conductivity), Fermi energy level, Kronig-Penney model and origin of energy bands, band structure of metals, semiconductors, and insulators. Direct and indirect bandgap semiconductors, Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), diffusion and drift, p -n junction.

(12 lectures)

Course Outcomes:

Upon successful completion of this course, the students should be able to:

- Describe a mathematical wave equation using the principles of wavesand oscillations
- Apply the knowledge for materials testing using Interference and Diffraction techniques.
- Understand the idea of wave function and to solve Schrodinger equation for simple potentials.
- Explain the role of semiconductors in different realms of physics and their applications in both science and technology.
- Identify the working elements of different lasers and estimate laser operation parameters.

Text Books:

- H. J. Pain, ―The physics of vibrations and waves‖, Wiley, 2006.
- Engineering Physics by **K. Thygarajan**, Mac Graw – Hill Publishing Co. New Delhi.

Reference Books:

- Physics Vol I & II, Halliday/Resnick/Krane 5th Edition, John Wiley, 2003.
- A. Ghatak, ―Optics‖, McGraw Hill Education, 2012.
- D. A. Neamen, ―Semiconductor Physics and Devices‖, Mac Graw – Hill Education, 2002.

BASIC ELECTRICAL ENGINEERING

(for EEE)

UNIT 1: DC Circuits (8 hours)

Electrical circuit elements (R, L and C), voltage and current sources – source transformation, network reduction techniques for simple Series & Parallel networks, Kirchhoff's current and voltage laws, Mesh and Nodal analysis of simple circuits with DC -Problems.

UNIT2: Network Theorems (8 hours)

Thevenin's & Norton's, Super position and Maximum power transfer theorems for DC excitation.

UNIT3: AC Circuits (8 hours)

Representation of sinusoidal waveforms, average, peak and rms values, Form factor Peak factor for sinusoidalwave form -Problems

Phasor - Phasor representation, Impedance, Admittance, Reactance, Susceptance, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits forseries & parallel combinations –sample Problems

UNIT4: Magnetic Circuits (8 hours)

Concept of self & mutual inductances, Dot Convention, Problems, Coefficient of coupling, Composite Magnetic circuit, analysis of Series and Parallel Magnetic Circuits, Duality and dual Circuits, problems

UNIT 5: Network Topology(6 hours)

Definition – Graph, tree, Co-tree, Incidence Matrix, Tie-Set & Cut – Set Matrices for Planar networks, Formulation of equilibrium equations based on graph theory, problems.

Suggested Text / Reference Books

D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.

D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.

L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.

E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.

V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.

Electrical Circuits – N. Sreenivasulu – Reem Publications

A. Chakarabarthi "Circuit Theory", Dhanapath Roy & Co

ENGINEERING GRAPHICS & DESIGN

(Common to CE, ME, EEE- II SEM)
(Common to ECE & CSE - I SEM)

Detailed contents:

Traditional Engineering Graphics:

Principles of Engineering Graphics; Orthographic Projection; Descriptive Geometry; Drawing Principles; Isometric Projection; Surface Development; Perspective; Reading a Drawing; Sectional Views; Dimensioning & Tolerances; True Length, Angle; intersection, Shortest Distance.

Computer Graphics:

Engineering Graphics Software; -Spatial Transformations; Orthographic Projections; Model Viewing; Co-ordinate Systems; Multi-view Projection; Exploded Assembly; Model Viewing; Animation; Spatial Manipulation; Surface Modeling; Solid Modeling; Introduction to Building Information Modeling (BIM)

(Except the basic essential concepts, most of the teaching part can happen concurrently in the laboratory)

Module 1: Overview of Computer Graphics

Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.

Module 2: Customization & CAD Drawing

Consisting of set up of the drawing page and the printer, including scale settings, Setting up of units and drawing limits; ISO and ANSI standards for coordinate dimensioning; Orthographic constraints, Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines, Applying various ways of drawing circles;

Module 3: Introduction to Engineering drawing

Principles of Engineering Graphics and their significance, usage of Drawing instruments, Conic sections including the Rectangular Hyperbola (General method only); Cycloid, Epicycloid, Hypocycloid and Involute.

Module 4: Orthographic Projections

Principles of Orthographic Projections-Conventions - Projections of Points and lines inclined to both planes; Projections of planes inclined Planes

Module 5: Projections of Regular Solids
Projections of solids inclined to both planes.
Floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, etc.

Module 6: Sections and Sectional Views of Right Angular Solids Sections of Prism, Cylinder, Pyramid and Cone
Development of surfaces of Right Regular Prism, Pyramid, Cylinder and Cone

Module 7: Isometric Projections
Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions;

Module 8: Annotations, layering & other functions
Applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines (extend/lengthen); Printing documents to paper using the print command; orthographic projection techniques.

Suggested Text/Reference Books:

Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House

Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education

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

(Corresponding set of) CAD Software Theory and User Manuals

Course Outcomes

The student will learn:

Introduction to engineering design and its place in society
Exposure to the visual aspects of engineering design
Exposure to engineering graphics standards
Exposure to solid modeling
Exposure to computer-aided geometric design
Exposure to creating working drawings
Exposure to engineering communication

ENGINEERING PHYSICS LAB

(Common to CE, ME, EEE- II SEM)
(Common to ECE & CSE - I SEM)

Course Description:

Physics Practical course is meant for making the students to gain practical knowledge to co relate with the theoretical studies. It covers experiments on Principles of Mechanics and Optics, Measurement of Magnetic field and studying Resonance using LCR Circuit.

Objectives:-

To explore the application of interference and diffraction by doing concerned experiments.
Elucidate the concepts of Physics through involvement in the experiment by applying theoretical knowledge.
Develop an ability to apply the knowledge of physics experiments in the later studies.
To understand the concept of energy gap, B-H curve, and synthesis of nano material by performing the experiments**.**

LIST OF EXPERIMENTS

Any 7 of the following experiments has to be performed in a semester:

Determination of wavelengths of various colours of mercury spectrum using diffraction grating in normal incidence method.

Determination of dispersive power of the prism.

Rigidity Modulus- Torsonal Pendulum.

Study of resonance effect in series and parallel LCR circuit.

Determination of thickness of thin object by wedge method.

Determination of radius of curvature of lens by Newton's Rings.

Laser : Determination of wavelength using diffraction grating.

Energy gap of a semiconductor using p-n junction diode.

Hysteresis: B-H curve.

Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.

Frequency of the tuning fork - Melde's apparatus.

Spring constant - Coupled Pendulums.

Course Outcomes:

Upon successful completion of this course, the students should be able to:

Students can aware of the application of interference, diffraction phenomena along with laser.

Apply the scientific process in the conduct and reporting of experimental investigations.

Understand measurement technology, usage of new instruments and real time applications in engineering studies.

Verify the theoretical ideas and concepts covered in lecture by doing hands on in the experiments.

Know about the characteristics of various materials in a practical manner and gain knowledge about various optical technique methods.

Acquire and interpret experimental data to examine the physical laws.

Lab Manual: Laboratory Manual for Engineering Physics.

Mode of Evaluation: Continuous Internal Evaluation, Practical End Examination.

BASIC ELECTRICAL ENGINEERING LAB

(for EEE)

List of Laboratory Experiments/Demonstrations:

Basic safety precautions. Introduction and use of measuring instruments – Voltmeter. Ammeter, Wattmeter, Multi-meter and oscilloscope.

Determination of values of R, L and C parameters of a given R-L-C series circuit

Verification of KCL and KVL.

Verification of Superposition Theorem

Verification of Thevenini's Theorem

Verification of Norton's Theorem

Verification of Maximum Power Transfer Theorem.

Determination of Active, reactive and apparent power for R-L circuit (series & parallel).

Determination of Active, reactive and apparent power for R-C circuit (series & parallel).

Determination of Active, reactive and apparent power for R-L-C circuit (series).

Determination of coefficient of coupling for Single Phase Transformer.

WORKSHOP AND MANUFACTURING PRACTICES

(Common to CE, ME, EEE- II SEM)

(Common to ECE & CSE - I SEM)

Lectures & videos: (10 hours)

Detailed contents

Manufacturing Methods- casting, forming, machining, joining, advanced manufacturing methods **(3 lectures)**

CNC machining and Additive manufacturing **(1 lecture)**

Fitting operations & power tools **(1 lecture)**

Electrical &Electronics **(1 lecture)**

Carpentry **(1 lecture)**

Plastic molding, glass cutting **(1 lecture)**

Metal casting **(1 lecture)**

Welding (arc welding & gas welding) and brazing **(1 lecture)**

Text/Reference Books:

Hajra Choudhury S.K., Hajra Choudhury 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.

(Kalpakjian S. And Steven S. Schmid, ―Manufacturing Engineering and Technology‖, 4th edition, Pearson Education India Edition, 2002.

Gowri P. Hariharan and A. Suresh Babu,‖Manufacturing Technology – I‖ Pearson Education, 2008.

Roy A. Lindberg, ―Processes and Materials of Manufacture‖, 4th edition, Prentice Hall India, 1998.

Rao P.N., ―Manufacturing Technology‖, Vol. I and Vol. II, Tata McGrawHill House, 2017.

Course Outcomes:

Upon completion of this course

The students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.

Workshop Practice:(60 hours)

Machine shop (10 hours)

Fitting shop (8 hours)

Carpentry (6 hours)

Electrical (8 hours)

Welding shop (8 hours (Arc welding 4 hrs + gas welding 4 hrs)

Casting (8 hours)
Tin Smithy (6 hours)
Examinations could involve the actual fabrication of simple components, utilizing one or more of the techniques covered above.

S.NO	EXPERIMENTS IN THE SYLLABUS
	MACHINE SHOP
1	STEP TURNING OPERATION
2	TAPER TURNING OPERATION
	FITTING SECTION
1	SQUARE FITTING
2	STEEPED FITTING
	CARPENTRY SECTION
1	TEE HALVING JOINT
2	DOVETAIL TEE HALVING JOINT
	HOUSE WIRING SECTION
1	TO CONTROL TWO LAMPS BY ONE SINGLE WAY SWITCH(IN SERIES)
2	TO CONTROL TWO LAMPS BY ONE SINGLE WAY SWITCH(PARALLEL)
	WELDING SECTION
1	SINGLE V BUTT JOINT
2	LAP JOINT
	FOUNDRY SECTION
1	SINGLE PIECE SQUARE PATTERN
2	SINGLE PIECE ROUND PATTERN
	SHEETMETAL SECTION
1	SQUARE TRY
2	CYLINDER

Laboratory Outcomes:

Upon completion of this laboratory course, students will be able to fabricate components with their own hands.

They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.

By assembling different components, they will be able to produce small devices of their interest.

B. Tech I Semester Mechanical Engineering

MATHEMATICS – I

(Common to All Branches)

Scheme	: 2018			
Internal Assessment	: 30	L	T	C
End Exam	: 70	**3**	**1**	**4**

Objectives:

To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following:

The essential tool of matrices in a comprehensive manner.
The convergence of series.
Maximaand minima of a function and the radius of curvature
The Jacobians and extrema of a function.
Evaluate the definite integrals, Beta and Gamma functions. Apply Fourier series in engineering problems.

Unit I: **Matrices: (14 Hours)**

Basic definitions of Symmetric, skew-symmetric and orthogonal matrices– Elementary transformations – Rank – Echelon form, Normal form– System of linear equations –Eigen values and Eigen vectors for real matrices– Cayley-Hamilton theorem – Diagonalization of matrix by orthogonal transformation.

Unit II: **Sequences and series: (8Hours)**

Convergence of sequences and series – Comparison test – p test– D'Alemberts ratio test– Cauchy's root test. Power series – Series for exponential, trigonometricand logarithm functions.

Unit III: **Differential Calculus: (10Hours)**

Taylor's and Maclaurin's series – Maxima and minima of single variable –Curvature: Curvature of a curve – Curvature of a circle – Radius of a curvature – Centre of Curvature – Equation to the circle of curvature.

Unit IV: **Multivariable Calculus: (10Hours)**

Functions of two or more variables – Partial derivatives, Total derivative – Jacobians – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

Unit V: **Integral Calculus:(12Hours)**

Evaluation of definite integrals– Beta and Gamma functions and their properties. Fourier series: Half range Fourier sine and cosine expansions– Parseval's theorem.

Text Books:

Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-43 edition 2014.

Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 9th edition-2013.

Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9th Edition, Reprint, 2002.

Reference Books:

Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11th Edition, Reprint 2010.

Linear Algebra: A Modern Introduction, D Poole, 2nd Edition, Brooks/Cole, 2005.

A Text Book of Engineering Mathematics, N.P. Bali and Manish Goyal, Lakshmi Publications, Reprint 2008.

Course Outcomes:

On completion of course Students are able to

Apply the essential tool of matrices in a comprehensive manner.

Find the convergence of series.

Find the radius of curvature and maxima and minima of a function.

Find the Jacobians and extrema of a function.

Evaluation of definite integrals, Beta and Gamma functions. Application of Fourier series in engineering problems.

ENGINEERING CHEMISTRY

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Objectives:

Knowledge in Chemistry serves as basic nutrient for the understanding and thereby design of materials of importance in life. Thus the advancement in Engineering depend on the outcome of basic sciences.

The Engineering Chemistry course for undergraduate students is framed to strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial! Engineering applications.

The course main aim is to impart in-depth knowledge of the subject and highlight the role of chemistry principles (or) applications in the field of engineering.

An attempt has been made to logically correlate the topic with its application.

After the completion of the course, the student would understand about the concepts of chemistry .

Module-1 : Atomic and molecular structure

Schrodinger wave equation. Particle in a box(one dimensional) and their applications .Molecular orbitals of diatomic molecules and plots of the multicenter orbitals. Equations for atomic and molecular orbitals. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.

Module-2: Periodic properties

Effective nuclear charge, penetration of orbitals, variations of s, p, d and f orbital energies of atoms in the periodic table, electronic configurations, atomic and ionic sizes,ionization energies, electron affinity and electronegativity, polarizability, oxidation states, coordination numbers and geometries, hard, soft acids and bases.

Module-3:

Intermolecular forces

Ionic, dipolar and van Der Waals interactions. Equations of state of real gases and critical phenomena.

Use of free energy in chemical equilibria

Thermodynamic functions: Introduction, define energy, entropy , Free energy.Free energy and emf.Cell potentials, the Nernst equation and applications.Water chemistry-types of water and Boiler troubles. Corrosion-types of corrosion and factors influencing corrosion.

Module-4: Spectroscopic techniques and applications

Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules.

Module-5:

Stereochemistry

Representations of 3 dimensional structures, structural isomers and stereoisomers,configurations and symmetry and chirality, enantiomers, diastereomers,optical activity,absolute configurations and conformational analysis of Cyclohexane.

Simple Organic Reactions

Introduction to reactions involving Substitution(SN^1 &SN^2), Addition Reactions involving C=C(Markonikoffreaction)&C=O(Grignardreagent),Elimination(E_1&E_2) Oxidation(Baeyer villiger reaction),Reduction(Clemmensen reduction).

Suggested Text Books

Engineering Chemistry, Satyaprakash, Khanna Book Publishing, Delhi

A Text Book of Engg. Chemistry, Shashi Chawla, Dhanpat Rai & Co. (P) Ltd.

Essentials of Physical Chemistry, Bahl&Tuli, S.Chand Publishing

Applied Chemistry, Sunita Rattan, Kataria

Engineering Chemistry, Baskar, Wiley

6. . Engineering Chemistry – I, D. GrourKrishana, Vikas Publishing

7. . Laboratory Manual Engg. Chemistry, Anupma Rajput, Dhanpat Rai & Co.

Course Outcomes

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:

Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.Rationalise bulk properties and processes using thermodynamic considerations. Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques. Rationalise periodic properties such as ionization potential, electronegativity,oxidation states and electronegativity.
List major chemical reactions that are used in the synthesis of molecules.

ENGLISH

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

1.Vocabulary Building

1.1 The concept of Word Formation
1.2 Root word from foreign languages and their use in English
1.3 Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives
1.4 Synonyms, antonyms
1.5 Idioms and phrases.

2 Basic Writing Skills

2.1 Sentence Structures
2.2 Use of phrases and clauses in sentences
2.3 Importance of proper punctuation
2.4 Creating coherence
2.5 Organizing principles of paragraphs in documents
2.6 Techniques for writing precisely

3 Transformation

3.1 Interchange of parts of speech
3.2 Active voice and Passive voice
3.3 Direct and Indirect speech
3.4 3.4Degrees of comparison
3.5 3.5Simple, compound and complex sentences

4. Identifying Common Errors in Writing

4.1 Subject-Verb agreement
4.2 Noun-pronoun agreement
4.3 Misplaced modifiers
4.4 Articles
4.5 Prepositions
4.6 Redundancies
4.7 Clichés
4.8 Tenses

Reading and Writing Practices 5.1 Comprehension
5.2 Précis Writing
5.3 Essay writing
5.4 Essay writing

PROGRAMMING FOR PROBLEM SOLVING

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Course Objectives

The course aims to provide exposure to problem-solving through programming
It aims to train the student to the basic concepts of the C programming language

Course Outcomes

The student will learn

To formulate simple algorithms for arithmetic and logical problems and to translate the algorithms to programs (in C language).
Choose the loops and decision making statements to solve the problem.
To implement different Operations on arrays.
To use functions to solve the given problem.
To understand structures, unions and pointers,

UNIT 1:

Introduction to Computers: - Introduction, computer hardware and software, creating and running programs, software development life cycle, algorithms, flowcharts.

Introduction to C programming: - Overview of C, structure of a C program, variables, constants, data types, identifiers, keywords, Input/output statements in C, programming examples.

UNIT 2:

Operators and Expressions:- Operators, expressions, precedence and associativity, evaluating expressions, type conversion, typedef, enumerations.

Decision making statements:if statement, if-else statement, nested if-else statement, switch statement.

Loops in C: while loop, for loop, do-while loop, nested for loops,

Jumping statements:break, continue and goto statements.

UNIT 3:

Arrays: Introduction, Declaration and initialization of 1D and 2D arrays.

Array applications: -bubble (exchange) sort, selection sort, linear search, binary search.

Strings: -Definition, declaration and initialization of strings, string I/O functions,string handling functions,array of strings (table of strings).

UNIT 4:

Functions: introduction, category of functions, parameter passing methods, storageclasses, recursivefunction.

Pointers: Understandingpointers, declaring and initialization of pointer variable, accessing the address of variables, accessing a variable through its pointer, chain of pointers.

UNIT 5:

Structures and union: Introduction, defining a structure, declaring structure variable, structure initialization, accessing members of structure, copying and comparing structure variables, structures within structures, array of structures, and introduction of union.

TEXT BOOKS

E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGraw Hill.
Rema Theraja, Programming in C, second edition, Oxford.

REFERENCE TEXT BOOKS

Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
R.G. Dromey, How to solve it by Computer, Pearson.
Yashavant Kanetkar, Let us C, 15th edition, BPB Publications.
Dr. P. ChennaReddy, Computer Fundamentals and C Programming, Second Edition.

CHEMISTRY LAB

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Choice of experiments from the following:

1.Estimation of Hardness of Water present in given water sample by EDTA method.

2. Determination of surface tension and viscosity.

3. Determination of chloride content of water.

4.Colligative properties using freezing point depression.

5.Estimation of Dissolved Oxygen present in given water sample by Winkler‘s method.

6.Potentiometry - determination of Redox potentials and emfs.

7.Synthesis of a polymer/drug.

8.Saponification/acid value of an oil.

Determination of cell constant and conductance of solutions.. 10.Chemical oscillations- Iodine clock reaction.

11.Determination of the partition coefficient of a substance between two immiscible liquids.

12. Adsorption of acetic acid by charcoal.

Laboratory Outcomes

The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering.

The students will learn to:

Estimate rate constants of reactions from concentration of reactants/products as a function of time. Measure molecular/system properties such as surface tension, viscosity,conductance of solutions, redox potentials, chloride content of water, etc.

- Synthesize a small drug molecule and analyse a salt sample.

PROGRAMMING FOR PROBLEM SOLVING LAB

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Laboratory Objectives

To impart knowledge so that the student will

know how to write and debug programs

know the principles of designing structured programs

Know when and how to use the appropriate statements available in the C language.

Write basic C programs using, Selection statements, Repetitive statements, Functions, Pointers, Arrays, Strings and structures

Laboratory Outcomes

To formulate the algorithms for simple problems

To translate given algorithms to a working and correct program

To be able to correct syntax errors as reported by the compilers

To be able to identify and correct logical errors encountered at run time

To be able to write iterative as well as recursive programs

To be able to represent data in arrays, strings and structures and manipulate them through a program

To be able to create, read and write to and from simple text files.

The student is expected to solve at least 12 assignments from different concepts. (Every year 12 different experiments).

DOS commands, Algorithms, Flowcharts and sample C programs

Practice DOS commands necessary for design of C programs.

Design and develop algorithms and flowcharts for simple and logical problems

If the total selling price of 15 items and total profit earned on them is input through the keyboard. Write a C program to find the cost price of one item.

Ramesh‘s basic salary is input through the keyboard. His dearness allowance is 40% of basic salary and house rent allowance is 20% of basic salary. Write a C program to calculate his gross salary.

The distance between two cities (in km) is input through the keyboard. Write a C program to convert and print the distance in meters, centimetres, inches and feet.

Write a program to take input of name, roll no and marks obtained by a student in 5 subjects each have its 100 full marks and display the name, roll no with percentage score secured.

Problems involving if-then-else structures

Write a C program to find out whether a given number is even number or odd number.

Write a C program to check whether a given year is leap year or not.

Design and develop an algorithm that takes three coefficients (***a***, ***b***, and ***c***) of a Quadratic equation ($ax^2+bx+c=0$) as input and compute all possible roots. Implement a C program for the developed algorithm and execute the same to output the possible roots for a given set of coefficients with appropriate messages.

If the ages of the Ramesh, Suresh and Mahesh are input through the keyboard, write a C program to determine youngest of the three.

A character is entered through keyboard. Write a C program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol using if-else and switch case. The following table shows the range of ASCII values for various characters.

Characters	**ASCII values**
A – Z	65 – 90
a – z	97 – 122
0 – 9	48 – 57
Special symbols	0 – 47, 58 – 64, 91 – 96, 123 – 127.

A library charges fine for every book returned late. For first five days the fine is 50 paisa, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a C program to accept the number of days that the member is late to return the book and display the fine or appropriate message.

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).

Problems involving Looping statements

If the sum of the cubes of each digit of a number is equal to the number itself, then the number is called Armstrong number. (for example, $153 = 1^3+5^3+3^3$). Design and develop an algorithm to find whether a given number is Armstrong number or not. Implement a C program for the developed algorithm.

Design and develop an algorithm to find the square root of a given number ***N***. Implement a C program for the same and execute for all possible inputs with appropriate messages. Note: **Don't use library function *sqrt(n)*.**

If a number and its reversed number are same then the number is called as palindrome number. Design and develop an algorithm to check whether a given number is palindrome or not. Implement a C program for the same.

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

Write a C program to evaluate the sin(x) function series

$$= \frac{}{} - \frac{}{} + \frac{}{} - \frac{}{} + \cdots$$

Fibonacci Sequence

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 program to generate the first N terms of the sequence.

Arrays

Write a C program to find the smallest and largest number in a given array.

Write a C program to find the frequency of a particular number in a list of integers.

Write a C program to sort the list of elements using
c) Bubble Sort b) Selection sort.

23. Write a C program to search for an element in a list of elements using
c) Linear search b) Binary search

24. Write a C program to find the transpose of a matrix.

Write a C program to read two matrices and perform the following operations

Addition of two matrices

Multiplication of two matrices

Additional Problems on arrays

Partitioning an array

Given a randomly ordered array of n elements, write a C program to partition the elements into two subsets such that elements $\leq X$ are in one subset and elements $\geq X$ are in another subset.

Finding the k^{th} smallest element

Given a randomly ordered array of n elements, write a C program to determine the k^{th} smallest element.

Array order reversal

Write a C program to rearrange the elements in an array so that they appear in reverse order.

Strings

If a string and its reversed string are same then the string is called as palindrome string. Design and develop an algorithm to check whether a given string is a palindrome or not and implement a C program for the same.

Write a C program to sort the names of students in a class in alphabetical order.

Additional Problems on strings

Write a C program to read two strings and perform the following operations without using built string library functions.

String length

String reversing

Comparison of two strings

Concatenation of two strings

Write a C program to count the number of vowels, consonants, digits, blank spaces and special characters in a given string.

Functions and Recursion

Write a C program to swap the contents of two variables using
- Call by value
- Call by reference.

Write a C program using recursion to
- Find the factorial of a given number
- Print the Fibonacci series up to a given number.
- Find the GCD of two integers.

Structures

Write a C program to define a structure with the following members.
Roll No., Name, marks in Sub1, Sub2, Sub3. Read the n students records and find the total marks of each student and print the result in the following format.

Roll No	Name	Sub1	Sub2	Sub3	Total marks	result
189Y1A0501	Kavya	80	70	75	225	Distinction

Files

36. Write a C program to copy the contents of one file to another file.

TEXT BOOKS

Yashavant Kanetkar, Let us C, 15th edition, BPB publications.

E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGraw Hill.

R.G. Dromey, How to solve it by Computer, Pearson.

ENGLISH LAB

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Oral Communication

(This unit involve interactive practice sessions in Language Lab)

- Listening Comprehension ----- Language Lab
- Pronunciation, Intonation, Stress and Rhythm ----- Language Lab

Common Everyday Situations: Conversations and Dialogues ------ Communication Lab

Communication at workplace ------ Communication Lab

• Interviews ------ Communication Lab • Formal Presentations

------ Communication Lab

B. Tech II Semester Mechanical Engineering

MATHEMATICS-II

(Common to All Branches)

Scheme	: 2018			
Internal Assessment	: 30	L	T	C
End Exam	: 70	**3**	**1**	**4**

Objectives:

To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following:

First order differential equations.
Linear differential equations with constant coefficients.
Laplace transforms in engineering problems.
Evaluate multiple integrals.
Understand Vector Calculus concepts and their applications.

Unit I: **First order ordinary differential equations:(10 Hours)**

Linear, Bernoulli equations, Exact and equations reducible to Exact. Applications: Orthogonal trajectories, Newton's law of cooling, Law of natural growth and decay.

Unit II: **Ordinary differential equations of higher order: (10Hours)**

Linear differential equations of second and higher order with constant coefficients – R.H.S term of the type e^{ax}, sinax, cosax, polynomials in x, e^{ax} V(x), xV(x) – Method of variation of parameters.

***Unit III*:Laplace transforms**: **(12Hours)**

Laplace transforms of standard functions – Properties of Laplace Transforms – Transforms of derivatives and integrals– Evaluation of integrals by Laplace transforms – Laplace transform of periodic functions. Convolution theorem. Inverse Laplace Transforms – Applications of Laplace transforms to ordinary differential equations.

Unit IV: **Multiple Integrals**:**(10Hours)**

Evaluation of double integrals in Cartesian coordinates and polar coordinates – Change of variables in double integrals – Change the order of integration in double integrals – Evaluation of triple integrals in Cartesian and polar coordinates – Change of variables in triple integrals.

Unit V: Vector calculus: (12Hours)

Vector differentiation: Scalar point function - Vector point function – Vector operator Del – Gradient – Divergence – Curl. Vector integration: Line, Surface and Volume integrals. Green's theorem in a plane, Stoke's theorem and Gauss-divergence theorems (Statements only). Applications of Green's, Stoke's and Gauss divergence theorems.

Text Books:

Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-43 edition 2014.

Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 9th edition-2013

Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9th Edition, Reprint, 2002.

Reference Books:

Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11th Edition, Reprint 2010.

A Text Book of Engineering Mathematics, N.P. Bali and Manish Goyal, Lakshmi Publications, Reprint 2008.

Outcomes:

On completion of course Students are able to

Solve the first order differential equations.

Solve linear differential equations with constant coefficients.

Apply Laplace Transforms in engineering problems.

Evaluation of multiple integrals.

Understand Vector Calculus concepts and their applications.

ENGINEERING PHYSICS

(Physics for ME)

Theory Prerequisite: Plus two level physics course

Course Description:

This course intends to provide the students to have a fair knowledge with an understanding about the theory and problems, Wave optics, lasers, Simple harmonic oscilatorsand their interaction,solids and semiconductors and to enable them to use these concepts in applications.

Course Objectives:

Expose students to theoretical and mathematical aspects of Interference, Diffraction techniques and Lasers for testing of materials.

To understand the concepts of Simple harmonic Oscilator & non dispensive Transverse & Longitudinal waves .

Develop knowledge and understanding the fundamental concepts of solids and semiconductors.

Adaptability to new developments in science and technology.

Course Syllabus:

Unit I: Wave Optics

Introduction, Huygens' Principle, Superposition of waves, Young's double slit experiment, expression for fringe width, interference in thin film by reflection, Newton's rings experiment, DiffractionFarunhofer diffraction due to single slit, and Diffraction grating (N-slits).

(10 lectures

UnitII: Lasers

Introduction to lasers, characteristics of laser, interaction of radiation with matter-spontaneous and stimulated emission, Einstein's coefficients; population inversion, excitation mechanisms, types of lasers: Solid-state lasers – Nd-YAG laser, Gas lasers - He-Ne Laser, Semiconductor p-n junction diode laser, Applications of lasers

(08 lectures)

Unit III:Damped and Forced Simple Harmonic Oscillator

Mechanical and electrical simple harmonic oscillators, Damped harmonic oscillator – heavy, critical and light damping, energy decay in a damped harmonic oscillator, Quality factor, Forced Mechanical and Electrical oscillators, Electrical and Mechanical impedance. (10 lectures)

UNIT IV:

Non-dispersive transverse and longitudinal waves in one dimension String

Transverse wave on a string, the wave equation on a string, Harmonic waves, reflection and transmission of waves at a boundary, impedance matching, standing waves and their eigenfrequencies, longitudinal waves and the wave equation for them. (08 lectures)

UnitV: Solids &Semiconductors

Introduction, Free electron theory of metals (drift velocity and electrical conductivity), Fermi energy level, Kronig-Penney model and origin of energy bands, band structure of metals, semiconductors, and insulators. Direct and indirect bandgap semiconductors, Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), diffusion and drift, p -n junction.

(10 lectures)

Course Outcomes:

Upon successful completion of the course, students will be able to

Apply the knowledge for materials testing using Interference and Diffraction techniques.

Identify the working elements of different lasers and estimate laser operation parameters

Compute Damped & Forced Simple Hormonic Oscilations.

Solve Tranverse & Longitudinal waves.

Explain the role of semiconductors in different realms of physics and their applications in both science and technology.

Text Books:

1.Engineering Physics by **K. Thygarajan**, Mac Graw – Hill Publishing Co. New Delhi.

‘ Oscillations and waves in physics‘, Ian G. Main.

ReferenceBooks:

The physics of vibrations and waves, ‗H.J. Pain‘.

Semiconductor Physics & Devices, ‗Neamen‘.

BASIC ELECTRICAL ENGINEERING

(Common to CE, ME – II SEM)

(Common to ECE , CSE – I SEM)

UNIT 1: DC Circuits (8 hours)

Electrical circuit elements (R, L and C), voltage and current sources – source transformation, Series & Parallel networks - Star-Delta transformation, Kirchoff's current and voltage laws, Mesh and Nodal analysis of simple circuits with DC -Problems.

UNIT 2: AC Circuits (8 hours)

Representation of sinusoidal waveforms, average, peak and rms values, Form factor Peak factor for sinusoidalwave form -Problems

Phasor-Phasor representation, Impedance, Admittance, Reactance, Susceptance, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits forseries & parallel combinations –simple Problems

UNIT 3: DC machines (8 hours)

DC Generators: Construction– working principle – EMF equation – types of DC generators- applications - simple problems.

Working Principle of DC motor, types, Torque Equation, Concept of Back EMF-applications - simple Problems.

UNIT 4: Transformers & Induction Machines (8 hours)

Single Phase Transformers: Principle of Operation, Constructional details, EMF equation, losses in transformers, regulation and efficiency,equivalent circuit - simple Problems.

Three phase Induction Motor: Construction and working principle, slip, rotor frequency, rotor current, and rotor power factor –simple Problems

UNIT 5: Electrical Installations (6 hours)

Components of LT Switchgear: Switch Fuse Unit (SFU), Miniature Circuit Breaker (MCB), Wires and Cables, Earthing. Batteries, Introduction to power converters.

Suggested Text / Reference Books

D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 2010.

D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill, 2009.

L. S. Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press, 2011.

E. Hughes, “Electrical and Electronics Technology”, Pearson, 2010.

V. D. Toro, “Electrical Engineering Fundamentals”, Prentice Hall India, 1989.

A. Chakarabarthi “Circuit Theory”, Dhanapath Roy & Co

Electrical Circuits – N. Sreenivasulu – Reem Publications

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ENGINEERING GRAPHICS & DESIGN

(Common to CE, ME, EEE- II SEM)
(Common to ECE & CSE - I SEM)

Detailed contents:

Traditional Engineering Graphics:

Principles of Engineering Graphics; Orthographic Projection; Descriptive Geometry; Drawing Principles; Isometric Projection; Surface Development; Perspective; Reading a Drawing; Sectional Views; Dimensioning & Tolerances; True Length, Angle; intersection, Shortest Distance.

Computer Graphics:

Engineering Graphics Software; -Spatial Transformations; Orthographic Projections; Model Viewing; Co-ordinate Systems; Multi-view Projection; Exploded Assembly; Model Viewing; Animation; Spatial Manipulation; Surface Modeling; Solid Modeling; Introduction to Building Information Modeling (BIM)

(Except the basic essential concepts, most of the teaching part can happen concurrently in the laboratory)

Module 1: Overview of Computer Graphics

Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.

Module 2: Customization & CAD Drawing

Consisting of set up of the drawing page and the printer, including scale settings, Setting up of units and drawing limits; ISO and ANSI standards for coordinate dimensioning; Orthographic constraints, Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines, Applying various ways of drawing circles;

Module 3: Introduction to Engineering drawing

Principles of Engineering Graphics and their significance, usage of Drawing instruments, Conic sections including the Rectangular Hyperbola (General method only); Cycloid, Epicycloid, Hypocycloid and Involute.

Module 4: Orthographic Projections

Principles of Orthographic Projections-Conventions - Projections of Points and lines inclined to both planes; Projections of planes inclined Planes

Module 5: Projections of Regular Solids
Projections of solids inclined to both planes.
Floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, etc.

Module 6: Sections and Sectional Views of Right Angular Solids Sections of Prism, Cylinder, Pyramid and Cone
Development of surfaces of Right Regular Prism, Pyramid, Cylinder and Cone

Module 7: Isometric Projections
Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions;

Module 8: Annotations, layering & other functions
Applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines (extend/lengthen); Printing documents to paper using the print command; orthographic projection techniques.

Suggested Text/Reference Books:

Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House

Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education

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

(Corresponding set of) CAD Software Theory and User Manuals

Course Outcomes

The student will learn:

Introduction to engineering design and its place in society
Exposure to the visual aspects of engineering design
Exposure to engineering graphics standards
Exposure to solid modeling
Exposure to computer-aided geometric design
Exposure to creating working drawings
Exposure to engineering communication

ENGINEERING PHYSICS LAB

(Common to CE, ME, EEE- II SEM)
(Common to ECE & CSE - I SEM)

Course Description:

Physics Practical course is meant for making the students to gain practical knowledge to co relate with the theoretical studies. It covers experiments on Principles of Mechanics and Optics, Measurement of Magnetic field and studying Resonance using LCR Circuit.

Objectives:-

To explore the application of interference and diffraction by doing concerned experiments.
Elucidate the concepts of Physics through involvement in the experiment by applying theoretical knowledge.
Develop an ability to apply the knowledge of physics experiments in the later studies.
To understand the concept of energy gap, B-H curve, and synthesis of nano material by performing the experiments**.**

LIST OF EXPERIMENTS

Any 7 of the following experiments has to be performed in a semester:

Determination of wavelengths of various colours of mercury spectrum using diffraction grating in normal incidence method.
Determination of dispersive power of the prism.
Rigidity Modulus- Torsonal Pendulum.
Study of resonance effect in series and parallel LCR circuit.
Determination of thickness of thin object by wedge method.
Determination of radius of curvature of lens by Newton's Rings.
Laser : Determination of wavelength using diffraction grating.
Energy gap of a semiconductor using p-n junction diode.
Hysteresis: B-H curve.
Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
Frequency of the tuning fork - Melde's apparatus.
Spring constant - Coupled Pendulums.

Course Outcomes:

Upon successful completion of this course, the students should be able to:

Students can aware of the application of interference, diffraction phenomena along with laser.

Apply the scientific process in the conduct and reporting of experimental investigations.

Understand measurement technology, usage of new instruments and real time applications in engineering studies.

Verify the theoretical ideas and concepts covered in lecture by doing hands on in the experiments.

Know about the characteristics of various materials in a practical manner and gain knowledge about various optical technique methods.

Acquire and interpret experimental data to examine the physical laws.

Lab Manual: Laboratory Manual for Engineering Physics.

Mode of Evaluation: Continuous Internal Evaluation, Practical End Examination.

BASIC ELECTRICAL ENGINEERING LAB

(Common to CE, ME – II SEM)
(Common to ECE, CSE – I SEM)

List of Laboratory Experiments/Demonstrations:

Basic safety precautions. Introduction and use of measuring instruments – Voltmeter. Ammeter, Wattmeter, Multi-meter and oscilloscope.

Determination of values of R, L and C parameters of a given R-L-C series circuit

Verification of KCL and KVL.

Determination of Active, reactive and apparent power for R-L circuit (series & parallel).

Determination of Active, reactive and apparent power for R-C circuit (series & parallel).

Load test on 1-phase transformer.

OC & SC tests on 1-phase transformer to obtain equivalent circuit.

Torque-speed characteristics of DC shunt motor.

Speed Control of three –phase induction motors using pole changing method

Demonstration of cut out sections of DC & AC machines

Study of fuse, MCB, Batteries

WORKSHOP AND MANUFACTURING PRACTICES

(Common to CE, ME, EEE- II SEM)
(Common to ECE & CSE - I SEM)

Lectures & videos: (10 hours)
Detailed contents

Manufacturing Methods- casting, forming, machining, joining, advanced manufacturing methods **(3 lectures)**

CNC machining and Additive manufacturing **(1 lecture)**

Fitting operations & power tools **(1 lecture)**

Electrical &Electronics **(1 lecture)**

Carpentry **(1 lecture)**

Plastic molding, glass cutting **(1 lecture)**

Metal casting **(1 lecture)**

Welding (arc welding & gas welding) and brazing **(1 lecture)**

Text/Reference Books:

Hajra Choudhury S.K., Hajra Choudhury 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.

(Kalpakjian S. And Steven S. Schmid, ―Manufacturing Engineering and Technology‖, 4th edition, Pearson Education India Edition, 2002.

Gowri P. Hariharan and A. Suresh Babu,‖Manufacturing Technology – I‖ Pearson Education, 2008.

Roy A. Lindberg, ―Processes and Materials of Manufacture‖, 4th edition, Prentice Hall India, 1998.

Rao P.N., ―Manufacturing Technology‖, Vol. I and Vol. II, Tata McGrawHill House, 2017.

Course Outcomes:

Upon completion of this course

The students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.

Workshop Practice:(60 hours)

Machine shop (10 hours)

Fitting shop (8 hours)

Carpentry (6 hours)

Electrical (8 hours)

Welding shop (8 hours (Arc welding 4 hrs + gas welding 4 hrs)

Casting (8 hours)

7. Tin Smithy (6 hours)

Examinations could involve the actual fabrication of simple components, utilizing one or more of the techniques covered above.

S.NO	EXPERIMENTS IN THE SYLLABUS
	MACHINE SHOP
1	STEP TURNING OPERATION
2	TAPER TURNING OPERATION
	FITTING SECTION
1	SQUARE FITTING
2	STEEPED FITTING
	CARPENTRY SECTION
1	TEE HALVING JOINT
2	DOVETAIL TEE HALVING JOINT
	HOUSE WIRING SECTION
1	TO CONTROL TWO LAMPS BY ONE SINGLE WAY SWITCH(IN SERIES)
2	TO CONTROL TWO LAMPS BY ONE SINGLE WAY SWITCH(PARALLEL)
	WELDING SECTION
1	SINGLE V BUTT JOINT
2	LAP JOINT
	FOUNDRY SECTION
1	SINGLE PIECE SQUARE PATTERN
2	SINGLE PIECE ROUND PATTERN
	SHEETMETAL SECTION
1	SQUARE TRY
2	CYLINDER

Laboratory Outcomes:

Upon completion of this laboratory course, students will be able to fabricate components with their own hands.

They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.

By assembling different components, they will be able to produce small devices of their interest.

B. Tech I Semester Electronics & Communication Engineering

MATHEMATICS – I

(Common to All Branches)

Scheme	: 2018			
Internal Assessment	: 30	L	T	C
End Exam	: 70	**3**	**1**	**4**

Objectives:

To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following:

The essential tool of matrices in a comprehensive manner.
The convergence of series.
Maximaand minima of a function and the radius of curvature
The Jacobians and extrema of a function.
Evaluate the definite integrals, Beta and Gamma functions. Apply Fourier series in engineering problems.

Unit I: **Matrices: (14 Hours)**

Basic definitions of Symmetric, skew-symmetric and orthogonal matrices– Elementary transformations – Rank – Echelon form, Normal form– System of linear equations –Eigen values and Eigen vectors for real matrices– Cayley-Hamilton theorem – Diagonalization of matrix by orthogonal transformation.

Unit II: **Sequences and series: (8Hours)**

Convergence of sequences and series – Comparison test – p test– D'Alemberts ratio test– Cauchy's root test. Power series – Series for exponential, trigonometricand logarithm functions.

Unit III: **Differential Calculus: (10Hours)**

Taylor's and Maclaurin's series – Maxima and minima of single variable –Curvature: Curvature of a curve – Curvature of a circle – Radius of a curvature – Centre of Curvature – Equation to the circle of curvature.

Unit IV: **Multivariable Calculus: (10Hours)**

Functions of two or more variables – Partial derivatives, Total derivative – Jacobians – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

Unit V: **Integral Calculus:(12Hours)**

Evaluation of definite integrals– Beta and Gamma functions and their properties. Fourier series: Half range Fourier sine and cosine expansions– Parseval's theorem.

Text Books:

Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-43 edition 2014.

Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 9th edition-2013.

Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9th Edition, Reprint, 2002.

Reference Books:

Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11th Edition, Reprint 2010.

Linear Algebra: A Modern Introduction, D Poole, 2nd Edition, Brooks/Cole, 2005.

A Text Book of Engineering Mathematics, N.P. Bali and Manish Goyal, Lakshmi Publications, Reprint 2008.

Course Outcomes:

On completion of course Students are able to

Apply the essential tool of matrices in a comprehensive manner.

Find the convergence of series.

Find the radius of curvature and maxima and minima of a function.

Find the Jacobians and extrema of a function.

Evaluation of definite integrals, Beta and Gamma functions. Application of Fourier series in engineering problems.

ENGINEERING PHYSICS
(Physics for EEE & ECE)

Prerequisite: Plus two level physics course

Course Description: Physics for Electrical and Computer Engineers isa basic physics course which provides fundamental knowledge to understand the concepts of Waves, Optics, Lasers, Quantum Mechanics, Solidsand Semiconductors.

Course Objectives:

Expose studentsin understanding the basic laws of nature through wave equationusing the principles of oscillations and waves.
Expose students to theoretical and mathematical aspects of Interference, Diffraction techniques and Lasers for testing of materials.
Develop knowledge and understanding the fundamental concepts of Quantum mechanics.
Develop knowledge and understanding the fundamental concepts of solids and semiconductors.
Adaptability to new developments in science and technology.

Course Syllabus:

Unit I:Waves

Introduction, Simple harmonic motion, Characteristics of Simple harmonic motion, Energy of Simple harmonic motion, Principle of Superposition of waves, Linear superposition of two waves of same frequency. Damped harmonic oscillations, Energy and power dissipations in Damped harmonic oscillations, forced harmonic oscillations, Resonance. (08 lectures)

Unit II: Wave Optics

Introduction, Huygens‘ Principle, Superposition of waves, Young‘s double slit experiment, expression for fringe width, interference in thin film by reflection, Newton‘s rings experiment, DiffractionFarunhofer diffraction due to single slit, and Diffraction grating (N-slits).
(10 lectures)

UnitIII: Lasers

Introduction to lasers, characteristics of laser, interaction of radiation with matter-spontaneous and stimulated emission, Einstein‘s coefficients; population inversion, excitation mechanisms, types of lasers: Solid-state lasers – Nd-YAG laser, Gas lasers - He-Ne Laser, Semiconductor p-n junction diode laser, Applications of lasers
(08 lectures)

UnitIV: Quantum Mechanics& Wave Equations

Introduction, Wave nature of matter, Uncertainty principle, Time-dependent and time-independent Schrodinger equations for wave function, Physical significance of wave function, Schrodinger equation for one dimensional particle in a box.

(8 lectures)

UnitV: Solids &Semiconductors

Introduction, Free electron theory of metals (drift velocity and electrical conductivity), Fermi energy level, Kronig-Penney model and origin of energy bands, band structure of metals, semiconductors, and insulators. Direct and indirect bandgap semiconductors, Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), diffusion and drift, p -n junction.

(12 lectures)

Course Outcomes:

Upon successful completion of this course, the students should be able to:

Describe a mathematical wave equation using the principles of wavesand oscillations
Apply the knowledge for materials testing using Interference and Diffraction techniques.
Understand the idea of wave function and to solve Schrodinger equation for simple potentials.
Explain the role of semiconductors in different realms of physics and their applications in both science and technology.
Identify the working elements of different lasers and estimate laser operation parameters.

Text Books:

1.H. J. Pain, ―The physics of vibrations and waves‖, Wiley, 2006.
Engineering Physics by **K. Thygarajan**, Mac Graw – Hill Publishing Co. New Delhi.

Reference Books:

Physics Vol I & II, Halliday/Resnick/Krane 5th Edition, John Wiley, 2003.
A. Ghatak, ―Optics‖, McGraw Hill Education, 2012.
D. A. Neamen, ―Semiconductor Physics and Devices‖, Mac Graw – Hill Education, 2002.

BASIC ELECTRICAL ENGINEERING

(Common to CE, ME – II SEM)
(Common to ECE, CSE – I SEM)

UNIT 1: DC Circuits (8 hours)

Electrical circuit elements (R, L and C), voltage and current sources – source transformation, Series & Parallel networks - Star-Delta transformation, Kirchoff's current and voltage laws, Mesh and Nodal analysis of simple circuits with DC -Problems.

UNIT 2: AC Circuits (8 hours)

Representation of sinusoidal waveforms, average, peak and rms values, Form factor Peak factor for sinusoidalwave form -Problems

Phasor-Phasor representation, Impedance, Admittance, Reactance, Susceptance, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits forseries & parallel combinations –simple Problems

UNIT 3: DC machines (8 hours)

DC Generators: Construction– working principle – EMF equation – types of DC generators- applications - simple problems.

Working Principle of DC motor, types, Torque Equation, Concept of Back EMF-applications - simple Problems.

UNIT 4: Transformers & Induction Machines (8 hours)

Single Phase Transformers: Principle of Operation, Constructional details, EMF equation, losses in transformers, regulation and efficiency,equivalent circuit - simple Problems.

Three phase Induction Motor: Construction and working principle, slip, rotor frequency, rotor current, and rotor power factor –simple Problems

UNIT 5: Electrical Installations (6 hours)

Components of LT Switchgear: Switch Fuse Unit (SFU), Miniature Circuit Breaker (MCB), Wires and Cables, Earthing. Batteries, Introduction to power converters.

Suggested Text / Reference Books

D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 2010.

D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill, 2009.

L. S. Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press, 2011.

E. Hughes, “Electrical and Electronics Technology”, Pearson, 2010.

V. D. Toro, “Electrical Engineering Fundamentals”, Prentice Hall India, 1989.

A. Chakarabarthi “Circuit Theory”, Dhanapath Roy & Co

Electrical Circuits – N. Sreenivasulu – Reem Publications

ENGINEERING GRAPHICS & DESIGN

(Common to CE, ME, EEE- II SEM)
(Common to ECE & CSE - I SEM)

Detailed contents:

Traditional Engineering Graphics:

Principles of Engineering Graphics; Orthographic Projection; Descriptive Geometry; Drawing Principles; Isometric Projection; Surface Development; Perspective; Reading a Drawing; Sectional Views; Dimensioning & Tolerances; True Length, Angle; intersection, Shortest Distance.

Computer Graphics:

Engineering Graphics Software; -Spatial Transformations; Orthographic Projections; Model Viewing; Co-ordinate Systems; Multi-view Projection; Exploded Assembly; Model Viewing; Animation; Spatial Manipulation; Surface Modeling; Solid Modeling; Introduction to Building Information Modeling (BIM)

(Except the basic essential concepts, most of the teaching part can happen concurrently in the laboratory)

Module 1: Overview of Computer Graphics

Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.

Module 2: Customization & CAD Drawing

Consisting of set up of the drawing page and the printer, including scale settings, Setting up of units and drawing limits; ISO and ANSI standards for coordinate dimensioning; Orthographic constraints, Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines, Applying various ways of drawing circles;

Module 3: Introduction to Engineering drawing

Principles of Engineering Graphics and their significance, usage of Drawing instruments, Conic sections including the Rectangular Hyperbola (General method only); Cycloid, Epicycloid, Hypocycloid and Involute.

Module 4: Orthographic Projections

Principles of Orthographic Projections-Conventions - Projections of Points and lines inclined to both planes; Projections of planes inclined Planes

Module 5: Projections of Regular Solids

Projections of solids inclined to both planes.

Floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, etc.

Module 6: Sections and Sectional Views of Right Angular Solids Sections of Prism, Cylinder, Pyramid and Cone

Development of surfaces of Right Regular Prism, Pyramid, Cylinder and Cone

Module 7: Isometric Projections

Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions;

Module 8: Annotations, layering & other functions

Applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines (extend/lengthen); Printing documents to paper using the print command; orthographic projection techniques.

Suggested Text/Reference Books:

Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House

Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education

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

(Corresponding set of) CAD Software Theory and User Manuals

Course Outcomes

The student will learn:

Introduction to engineering design and its place in society
Exposure to the visual aspects of engineering design
Exposure to engineering graphics standards
Exposure to solid modeling
Exposure to computer-aided geometric design
Exposure to creating working drawings
Exposure to engineering communication

ENGINEERING PHYSICS LAB

(Common to CE, ME, EEE- II SEM)
(Common to ECE & CSE - I SEM)

Course Description:

Physics Practical course is meant for making the students to gain practical knowledge to co relate with the theoretical studies. It covers experiments on Principles of Mechanics and Optics, Measurement of Magnetic field and studying Resonance using LCR Circuit.

Objectives:-

To explore the application of interference and diffraction by doing concerned experiments.
Elucidate the concepts of Physics through involvement in the experiment by applying theoretical knowledge.
Develop an ability to apply the knowledge of physics experiments in the later studies.
To understand the concept of energy gap, B-H curve, and synthesis of nano material by performing the experiments**.**

LIST OF EXPERIMENTS

Any 7 of the following experiments has to be performed in a semester:

Determination of wavelengths of various colours of mercury spectrum using diffraction grating in normal incidence method.
Determination of dispersive power of the prism.
Rigidity Modulus- Torsonal Pendulum.
Study of resonance effect in series and parallel LCR circuit.
Determination of thickness of thin object by wedge method.
Determination of radius of curvature of lens by Newton's Rings.
Laser : Determination of wavelength using diffraction grating.
Energy gap of a semiconductor using p-n junction diode.
Hysteresis: B-H curve.
Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
Frequency of the tuning fork - Melde's apparatus.
Spring constant - Coupled Pendulums.

Course Outcomes:

Upon successful completion of this course, the students should be able to:

Students can aware of the application of interference, diffraction phenomena along with laser.
Apply the scientific process in the conduct and reporting of experimental investigations.
Understand measurement technology, usage of new instruments and real time applications in engineering studies.
Verify the theoretical ideas and concepts covered in lecture by doing hands on in the experiments.
Know about the characteristics of various materials in a practical manner and gain knowledge about various optical technique methods.
Acquire and interpret experimental data to examine the physical laws.

Lab Manual: Laboratory Manual for Engineering Physics.

Mode of Evaluation: Continuous Internal Evaluation, Practical End Examination.

BASIC ELECTRICAL ENGINEERING LAB

(Common to CE, ME- II SEM)
(Common to ECE & CSE - I SEM)

List of Laboratory Experiments/Demonstrations:

Basic safety precautions. Introduction and use of measuring instruments – Voltmeter. Ammeter, Wattmeter, Multi-meter and oscilloscope.

Determination of values of R, L and C parameters of a given R-L-C series circuit

Verification of KCL and KVL.

Determination of Active, reactive and apparent power for R-L circuit (series & parallel).

Determination of Active, reactive and apparent power for R-C circuit (series & parallel).

Load test on 1-phase transformer.

OC & SC tests on 1-phase transformer to obtain equivalent circuit.

Torque-speed characteristics of DC shunt motor.

Speed Control of three –phase induction motors using pole changing method

Demonstration of cut out sections of DC & AC machines

Study of fuse, MCB, Batteries

WORKSHOP AND MANUFACTURING PRACTICES

(Common to CE, ME, EEE- II SEM)
(Common to ECE & CSE - I SEM)

Lectures & videos: (10 hours)
Detailed contents

Manufacturing Methods- casting, forming, machining, joining, advanced manufacturing methods **(3 lectures)**

CNC machining and Additive manufacturing **(1 lecture)**

Fitting operations & power tools **(1 lecture)**

Electrical &Electronics **(1 lecture)**

Carpentry **(1 lecture)**

Plastic molding, glass cutting **(1 lecture)**

Metal casting **(1 lecture)**

Welding (arc welding & gas welding) and brazing **(1 lecture)**

Text/Reference Books:

Hajra Choudhury S.K., Hajra Choudhury 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.

(Kalpakjian S. And Steven S. Schmid, ―Manufacturing Engineering and Technology‖, 4th edition, Pearson Education India Edition, 2002.

Gowri P. Hariharan and A. Suresh Babu,‖Manufacturing Technology – I‖ Pearson Education, 2008.

Roy A. Lindberg, ―Processes and Materials of Manufacture‖, 4th edition, Prentice Hall India, 1998.

Rao P.N., ―Manufacturing Technology‖, Vol. I and Vol. II, Tata McGrawHill House, 2017.

Course Outcomes:

Upon completion of this course

The students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.

Workshop Practice:(60 hours)

Machine shop (10 hours)

Fitting shop (8 hours)

Carpentry (6 hours)

Electrical (8 hours)

Welding shop (8 hours (Arc welding 4 hrs + gas welding 4 hrs)

Casting (8 hours)
Tin Smithy (6 hours)
Examinations could involve the actual fabrication of simple components, utilizing one or more of the techniques covered above.

S.NO	EXPERIMENTS IN THE SYLLABUS
	MACHINE SHOP
1	STEP TURNING OPERATION
2	TAPER TURNING OPERATION
	FITTING SECTION
1	SQUARE FITTING
2	STEEPED FITTING
	CARPENTRY SECTION
1	TEE HALVING JOINT
2	DOVETAIL TEE HALVING JOINT
	HOUSE WIRING SECTION
1	TO CONTROL TWO LAMPS BY ONE SINGLE WAY SWITCH(IN SERIES)
2	TO CONTROL TWO LAMPS BY ONE SINGLE WAY SWITCH(PARALLEL)
	WELDING SECTION
1	SINGLE V BUTT JOINT
2	LAP JOINT
	FOUNDRY SECTION
1	SINGLE PIECE SQUARE PATTERN
2	SINGLE PIECE ROUND PATTERN
	SHEETMETAL SECTION
1	SQUARE TRY
2	CYLINDER

Laboratory Outcomes:

Upon completion of this laboratory course, students will be able to fabricate components with their own hands.

They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.

By assembling different components, they will be able to produce small devices of their interest.

B. Tech II Semester Electronics & Communication Engineering

MATHEMATICS-II

(Common to All Branches)

Scheme	: 2018			
Internal Assessment	: 30	L	T	C
End Exam	: 70	**3**	**1**	**4**

Objectives:

To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following:

First order differential equations.
Linear differential equations with constant coefficients.
Laplace transforms in engineering problems.
Evaluate multiple integrals.
Understand Vector Calculus concepts and their applications.

Unit I: **First order ordinary differential equations:(10 Hours)**

Linear, Bernoulli equations, Exact and equations reducible to Exact. Applications: Orthogonal trajectories, Newton's law of cooling, Law of natural growth and decay.

Unit II: **Ordinary differential equations of higher order: (10Hours)**

Linear differential equations of second and higher order with constant coefficients – R.H.S term of the type e^{ax}, sinax, cosax, polynomials in x, e^{ax} V(x), xV(x) – Method of variation of parameters.

***Unit III*:Laplace transforms**: **(12Hours)**

Laplace transforms of standard functions – Properties of Laplace Transforms – Transforms of derivatives and integrals– Evaluation of integrals by Laplace transforms – Laplace transform of periodic functions. Convolution theorem. Inverse Laplace Transforms – Applications of Laplace transforms to ordinary differential equations.

Unit IV: **Multiple Integrals**:**(10Hours)**

Evaluation of double integrals in Cartesian coordinates and polar coordinates – Change of variables in double integrals – Change the order of integration in double integrals – Evaluation of triple integrals in Cartesian and polar coordinates – Change of variables in triple integrals.

Unit V: Vector calculus: (12Hours)

Vector differentiation: Scalar point function - Vector point function – Vector operator Del – Gradient – Divergence – Curl. Vector integration: Line, Surface and Volume integrals. Green's

theorem in a plane, Stoke‘s theorem and Gauss-divergence theorems (Statements only). Applications of Green‘s, Stoke‘s and Gauss divergence theorems.

Text Books:

Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-43 edition 2014.

Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 9^{th} edition-2013

Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9^{th} Edition, Reprint, 2002.

Reference Books:

Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11^{th} Edition, Reprint 2010.

A Text Book of Engineering Mathematics, N.P. Bali and Manish Goyal, Lakshmi Publications, Reprint 2008.

Outcomes:

On completion of course Students are able to

Solve the first order differential equations.

Solve linear differential equations with constant coefficients.

Apply Laplace Transforms in engineering problems.

Evaluation of multiple integrals.

Understand Vector Calculus concepts and their applications.

ENGINEERING CHEMISTRY

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Objectives:

Knowledge in Chemistry serves as basic nutrient for the understanding and thereby design of materials of importance in life. Thus the advancement in Engineering depend on the outcome of basic sciences.

The Engineering Chemistry course for undergraduate students is framed to strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial! Engineering applications.

The course main aim is to impart in-depth knowledge of the subject and highlight the role of chemistry principles (or) applications in the field of engineering.

An attempt has been made to logically correlate the topic with its application.

After the completion of the course, the student would understand about the concepts of chemistry .

Module-1 : Atomic and molecular structure

Schrodinger wave equation. Particle in a box(one dimensional) and their applications .Molecular orbitals of diatomic molecules and plots of the multicenter orbitals. Equations for atomic and molecular orbitals. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.

Module-2: Periodic properties

Effective nuclear charge, penetration of orbitals, variations of s, p, d and f orbital energies of atoms in the periodic table, electronic configurations, atomic and ionic sizes,ionization energies, electron affinity and electronegativity, polarizability, oxidation states, coordination numbers and geometries, hard, soft acids and bases.

Module-3:

Intermolecular forces

Ionic, dipolar and van Der Waals interactions. Equations of state of real gases and critical phenomena.

Use of free energy in chemical equilibria

Thermodynamic functions: Introduction, define energy, entropy , Free energy.Free energy and emf.Cell potentials, the Nernst equation and applications.Water chemistry-types of water and Boiler troubles. Corrosion-types of corrosion and factors influencing corrosion.

Module-4: Spectroscopic techniques and applications

Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules.

Module-5:

Stereochemistry

Representations of 3 dimensional structures, structural isomers and stereoisomers,configurations and symmetry and chirality, enantiomers, diastereomers,optical activity,absolute configurations and conformational analysis of Cyclohexane.

Simple Organic Reactions

Introduction to reactions involving Substitution(SN^1 &SN^2), Addition Reactions involving C=C(Markonikoffreaction)&C=O(Grignardreagent),Elimination(E_1&E_2) Oxidation(Baeyer villiger reaction),Reduction(Clemmensen reduction).

Suggested Text Books

Engineering Chemistry, Satyaprakash, Khanna Book Publishing, Delhi

A Text Book of Engg. Chemistry, Shashi Chawla, Dhanpat Rai & Co. (P) Ltd.

3. . Essentials of Physical Chemistry, Bahl&Tuli, S.Chand Publishing

Applied Chemistry, Sunita Rattan, Kataria

Engineering Chemistry, Baskar, Wiley

6. . Engineering Chemistry – I, D. GrourKrishana, Vikas Publishing

7. . Laboratory Manual Engg. Chemistry, Anupma Rajput, Dhanpat Rai & Co.

Course Outcomes

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:

Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.Rationalise bulk properties and processes using thermodynamic considerations. Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques. Rationalise periodic properties such as ionization potential, electronegativity,oxidation states and electronegativity.

List major chemical reactions that are used in the synthesis of molecules.

ENGLISH

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Vocabulary Building

1.1 The concept of Word Formation
1.2 Root word from foreign languages and their use in English
1.3 Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives
1.4 Synonyms, antonyms
1.5 Idioms and phrases.

Basic Writing Skills

2.1Sentence Structures
2.2Use of phrases and clauses in sentences
2.3Importance of proper punctuation
2.4Creating coherence
2.5Organizing principles of paragraphs in documents
2.6Techniques for writing precisely

Transformation

3.1 Interchange of parts of speech
3.2 Active voice and Passive voice
3.3 Direct and Indirect speech
3.4 Degrees of comparison
3.5 Simple, compound and complex sentences

Identifying Common Errors in Writing

4.1 Subject-Verb agreement
4.2 Noun-pronoun agreement
4.3 Misplaced modifiers
4.4 Articles
4.5 Prepositions
4.6 Redundancies
4.7 Clichés
4.8 Tenses

Reading and Writing Practices 5.1 Comprehension
5.2 Précis Writing
5.3 Essay writing
5.4 Essay writing

PROGRAMMING FOR PROBLEM SOLVING

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Course Objectives

The course aims to provide exposure to problem-solving through programming
It aims to train the student to the basic concepts of the C programming language

Course Outcomes

The student will learn

To formulate simple algorithms for arithmetic and logical problems and to translate the algorithms to programs (in C language).
Choose the loops and decision making statements to solve the problem.
To implement different Operations on arrays.
To use functions to solve the given problem.
To understand structures, unions and pointers,

UNIT 1:

Introduction to Computers: - Introduction, computer hardware and software, creating and running programs, software development life cycle, algorithms, flowcharts.

Introduction to C programming: - Overview of C, structure of a C program, variables, constants, data types, identifiers, keywords, Input/output statements in C, programming examples.

UNIT 2:

Operators and Expressions:- Operators, expressions, precedence and associativity, evaluating expressions, type conversion, typedef, enumerations.

Decision making statements:if statement, if-else statement, nested if-else statement, switch statement.

Loops in C: while loop, for loop, do-while loop, nested for loops,

Jumping statements:break, continue and goto statements.

UNIT 3:

Arrays: Introduction, Declaration and initialization of 1D and 2D arrays.

Array applications: -bubble (exchange) sort, selection sort, linear search, binary search.

Strings: -Definition, declaration and initialization of strings, string I/O functions,string handling functions,array of strings (table of strings).

UNIT 4:

Functions: introduction, category of functions, parameter passing methods, storageclasses, recursivefunction.

Pointers: Understandingpointers, declaring and initialization of pointer variable, accessing the address of variables, accessing a variable through its pointer, chain of pointers.

UNIT 5:

Structures and union: Introduction, defining a structure, declaring structure variable, structure initialization, accessing members of structure, copying and comparing structure variables, structures within structures, array of structures, and introduction of union.

TEXT BOOKS

E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGraw Hill.
Rema Theraja, Programming in C, second edition, Oxford.

REFERENCE TEXT BOOKS

Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
R.G. Dromey, How to solve it by Computer, Pearson.
Yashavant Kanetkar, Let us C, 15th edition, BPB Publications.
Dr. P. ChennaReddy, Computer Fundamentals and C Programming, Second Edition.

CHEMISTRY LAB

(Common to CE, ME, EEE- I SEM)

(Common to ECE & CSE - II SEM)

Choice of experiments from the following:

1.Estimation of Hardness of Water present in given water sample by EDTA method.

Determination of surface tension and viscosity.

3. Determination of chloride content of water.

4.Colligative properties using freezing point depression.

5.Estimation of Dissolved Oxygen present in given water sample by Winkler's method.

6.Potentiometry - determination of Redox potentials and emfs.

7.Synthesis of a polymer/drug.

8.Saponification/acid value of an oil.

Determination of cell constant and conductance of solutions.. 10.Chemical oscillations- Iodine clock reaction.

11.Determination of the partition coefficient of a substance between two immiscible liquids.

12. Adsorption of acetic acid by charcoal.

Laboratory Outcomes

The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering.

The students will learn to:

Estimate rate constants of reactions from concentration of reactants/products as a function of time. Measure molecular/system properties such as surface tension, viscosity,conductance of solutions, redox potentials, chloride content of water, etc.

- Synthesize a small drug molecule and analyse a salt sample.

PROGRAMMING FOR PROBLEM SOLVING LAB

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Laboratory Objectives

To impart knowledge so that the student will

know how to write and debug programs

know the principles of designing structured programs

Know when and how to use the appropriate statements available in the C language.

Write basic C programs using, Selection statements, Repetitive statements, Functions, Pointers, Arrays, Strings and structures

Laboratory Outcomes

To formulate the algorithms for simple problems

To translate given algorithms to a working and correct program

To be able to correct syntax errors as reported by the compilers

To be able to identify and correct logical errors encountered at run time

To be able to write iterative as well as recursive programs

To be able to represent data in arrays, strings and structures and manipulate them through a program

To be able to create, read and write to and from simple text files.

The student is expected to solve at least 12 assignments from different concepts. (Every year 12 different experiments).

DOS commands, Algorithms, Flowcharts and sample C programs

Practice DOS commands necessary for design of C programs.

Design and develop algorithms and flowcharts for simple and logical problems

If the total selling price of 15 items and total profit earned on them is input through the keyboard. Write a C program to find the cost price of one item.

Ramesh‘s basic salary is input through the keyboard. His dearness allowance is 40% of basic salary and house rent allowance is 20% of basic salary. Write a C program to calculate his gross salary.

The distance between two cities (in km) is input through the keyboard. Write a C program to convert and print the distance in meters, centimetres, inches and feet.

Write a program to take input of name, roll no and marks obtained by a student in 5 subjects each have its 100 full marks and display the name, roll no with percentage score secured.

Problems involving if-then-else structures

Write a C program to find out whether a given number is even number or odd number.

Write a C program to check whether a given year is leap year or not.

Design and develop an algorithm that takes three coefficients (***a***, ***b***, and ***c***) of a Quadratic equation ($ax^2+bx+c=0$) as input and compute all possible roots. Implement a C program for the developed algorithm and execute the same to output the possible roots for a given set of coefficients with appropriate messages.

If the ages of the Ramesh, Suresh and Mahesh are input through the keyboard, write a C program to determine youngest of the three.

A character is entered through keyboard. Write a C program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol using if-else and switch case. The following table shows the range of ASCII values for various characters.

Characters	**ASCII values**
A – Z	65 – 90
a – z	97 – 122
0 – 9	48 – 57
Special symbols	0 – 47, 58 – 64, 91 – 96, 123 – 127.

A library charges fine for every book returned late. For first five days the fine is 50 paisa, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a C program to accept the number of days that the member is late to return the book and display the fine or appropriate message.

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).

Problems involving Looping statements

If the sum of the cubes of each digit of a number is equal to the number itself, then the number is called Armstrong number. (for example, $153 = 1^3+5^3+3^3$). Design and develop an algorithm to find whether a given number is Armstrong number or not. Implement a C program for the developed algorithm.

Design and develop an algorithm to find the square root of a given number ***N***. Implement a C program for the same and execute for all possible inputs with appropriate messages. Note: **Don't use library function *sqrt(n)*.**

If a number and its reversed number are same then the number is called as palindrome number. Design and develop an algorithm to check whether a given number is palindrome or not. Implement a C program for the same.

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

Write a C program to evaluate the sin(x) function series

$$= \frac{}{} - \frac{}{} + \frac{}{} - \frac{}{} + \cdots$$

Fibonacci Sequence

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 program to generate the first N terms of the sequence.

Arrays

Write a C program to find the smallest and largest number in a given array.

Write a C program to find the frequency of a particular number in a list of integers.

Write a C program to sort the list of elements using

d) Bubble Sort b) Selection sort.

23. Write a C program to search for an element in a list of elements using

d) Linear search b) Binary search

Write a C program to find the transpose of a matrix.

Write a C program to read two matrices and perform the following operations

Addition of two matrices
Multiplication of two matrices

Additional Problems on arrays

Partitioning an array

Given a randomly ordered array of n elements, write a C program to partition the elements into two subsets such that elements ≤X are in one subset and elements ≥X are in another subset.

Finding the k^{th} smallest element

Given a randomly ordered array of n elements, write a C program to determine the k^{th} smallest element.

Array order reversal

Write a C program to rearrange the elements in an array so that they appear in reverse order.

Strings

If a string and its reversed string are same then the string is called as palindrome string. Design and develop an algorithm to check whether a given string is a palindrome or not and implement a C program for the same.

Write a C program to sort the names of students in a class in alphabetical order.

Additional Problems on strings

Write a C program to read two strings and perform the following operations without using built string library functions.

- String length
- String reversing
- Comparison of two strings
- Concatenation of two strings

Write a C program to count the number of vowels, consonants, digits, blank spaces and special characters in a given string.

Functions and Recursion

Write a C program to swap the contents of two variables using

- Call by value
- Call by reference.

Write a C program using recursion to

- Find the factorial of a given number
- Print the Fibonacci series up to a given number.
- Find the GCD of two integers.

Structures

Write a C program to define a structure with the following members.

Roll No., Name, marks in Sub1, Sub2, Sub3. Read the n students records and find the total marks of each student and print the result in the following format.

Roll No	Name	Sub1	Sub2	Sub3	Total marks	result
189Y1A0501	Kavya	80	70	75	225	Distinction

Files

36. Write a C program to copy the contents of one file to another file.

TEXT BOOKS

Yashavant Kanetkar, Let us C, 15th edition, BPB publications.

E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGraw Hill.

R.G. Dromey, How to solve it by Computer, Pearson.

ENGLISH LAB

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Oral Communication

(This unit involve interactive practice sessions in Language Lab)

- Listening Comprehension ----- Language Lab
- Pronunciation, Intonation, Stress and Rhythm ----- Language Lab

Common Everyday Situations: Conversations and Dialogues ------ Communication Lab

Communication at workplace ------ Communication Lab

- Interviews ------ Communication Lab
- Formal Presentations ------ Communication Lab

B. Tech I Semester Computer Science & Engineering

MATHEMATICS – I

(Common to All Branches)

Scheme	: 2018			
Internal Assessment	: 30	L	T	C
End Exam	: 70	**3**	**1**	**4**

Objectives:

To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following:

The essential tool of matrices in a comprehensive manner.
The convergence of series.
Maximaand minima of a function and the radius of curvature
The Jacobians and extrema of a function.
Evaluate the definite integrals, Beta and Gamma functions. Apply Fourier series in engineering problems.

Unit I: **Matrices: (14 Hours)**

Basic definitions of Symmetric, skew-symmetric and orthogonal matrices– Elementary transformations – Rank – Echelon form, Normal form– System of linear equations –Eigen values and Eigen vectors for real matrices– Cayley-Hamilton theorem – Diagonalization of matrix by orthogonal transformation.

Unit II: **Sequences and series: (8Hours)**

Convergence of sequences and series – Comparison test – p test– D'Alemberts ratio test– Cauchy's root test. Power series – Series for exponential, trigonometricand logarithm functions.

Unit III: **Differential Calculus: (10Hours)**

Taylor's and Maclaurin's series – Maxima and minima of single variable –Curvature: Curvature of a curve – Curvature of a circle – Radius of a curvature – Centre of Curvature – Equation to the circle of curvature.

Unit IV: **Multivariable Calculus: (10Hours)**

Functions of two or more variables – Partial derivatives, Total derivative – Jacobians – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

Unit V: **Integral Calculus:(12Hours)**

Evaluation of definite integrals– Beta and Gamma functions and their properties. Fourier series: Half range Fourier sine and cosine expansions– Parseval's theorem.

Text Books:

Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-43 edition 2014.

Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 9th edition-2013.

Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9th Edition, Reprint, 2002.

Reference Books:

Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11th Edition, Reprint 2010.

Linear Algebra: A Modern Introduction, D Poole, 2nd Edition, Brooks/Cole, 2005.

A Text Book of Engineering Mathematics, N.P. Bali and Manish Goyal, Lakshmi Publications, Reprint 2008.

Course Outcomes:

On completion of course Students are able to

Apply the essential tool of matrices in a comprehensive manner.

Find the convergence of series.

Find the radius of curvature and maxima and minima of a function.

Find the Jacobians and extrema of a function.

Evaluation of definite integrals, Beta and Gamma functions. Application of Fourier series in engineering problems.

ENGINEERING PHYSICS

(Physics for CSE)

Prerequisite: Plus two level physics course

Course Objectives:

Analyze and understandthe concepts of waves and optics to preparethe students for advanced level courses.

Expose students to theoretical and mathematical aspects of Interference, Diffraction techniques and Lasers for testing of materials.

3.Develop knowledge and understanding the fundamental concepts of Electronic materials.

Develop knowledge and understanding the fundamental concepts of semiconductorsand nanomaterials.

Adaptability to new developments in science and technology.

Course Syllabus:

Unit I: Light &Optics

Huygens‘ Principle, superposition of waves, Young‘s double slit experiment, expression for fringe width, interference in thin film by reflection, Newton‘s rings experiment, DiffractionFarunhofer diffraction due to single slit, and Diffraction grating (N-slit)

(12 lectures)

UnitII: Lasers

Introduction to lasers, characteristics of laser, interaction of radiation with matter-spontaneous and stimulated emission, Einstein‘s coefficients; population inversion, excitation mechanisms, types of lasers: Solid-state lasers – Nd-YAG laser, Gas lasers - He-Ne Laser, Semiconductor p-n junction diode laser, Applications of lasers

(08 lectures)

UNIT III: Electronic materials

Free electron theory, Density of states and energy band diagrams, Kronig-Penny model (to introduce origin of band gap),E-k diagram, Energy bands in solids, Direct and indirect bandgaps, Types of electronic materials: metals, semiconductors, and insulators, Density of states, Fermi level, Effective mass, Phonons.

(10 lectures)

UNIT IV: Semiconductors

Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), Carrier generation and recombination, Carrier transport: diffusion and drift, p-n junction, Metal-semiconductor junction (Ohmic and Schottky), Semiconductor materials of interest for optoelectronic devices.

(10 lectures)

UNIT 5: Engineered Nanomaterials

Introduction, significance of Nano scale and types of nanomaterials, Properties of nanomaterials: physical , optical, thermal, mechanical and magnetic properties. Synthesis of nanomaterials: Ball-milling, Chemical Vapour Deposition and Sol-Gel methods. Applications of nanomaterials.

(06 lectures)

Course Outcomes:

Upon successful completion of this course, the students should be able to:

Apply the knowledge for materials testing using Interference and Diffraction techniques.

Identify the working elements of different lasers and estimate laser operation parameters

Understand the idea Electronic materials & its applications.

Explain the role of semiconductors in different realms of physics and their applications in both science and technology.

Explain the role of nanomaterials in different realms of physics and their applications in both science and technology.

Text Books:

Engineering Physics by **K. Thygarajan**, Mac Graw – Hill Publishing Co. New Delhi.

P. Bhattacharya, Semiconductor Optoelectronic Devices, Pearson Education,2003.

References:

S. M. Sze, Semiconductor Devices: Physics and Technology, Wiley (2008).
Online course: ―Semiconductor Optoelectronics‖ by M R Shenoy on NPTEL

BASIC ELECTRICAL ENGINEERING

(Common to CE, ME- II SEM)
(Common to ECE & CSE - I SEM)

UNIT 1: DC Circuits (8 hours)

Electrical circuit elements (R, L and C), voltage and current sources – source transformation, Series & Parallel networks - Star-Delta transformation, Kirchoff's current and voltage laws, Mesh and Nodal analysis of simple circuits with DC -Problems.

UNIT 2: AC Circuits (8 hours)

Representation of sinusoidal waveforms, average, peak and rms values, Form factor Peak factor for sinusoidalwave form -Problems

Phasor-Phasor representation, Impedance, Admittance, Reactance, Susceptance, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits forseries & parallel combinations –simple Problems

UNIT 3: DC machines (8 hours)

DC Generators: Construction– working principle – EMF equation – types of DC generators- applications - simple problems.

Working Principle of DC motor, types, Torque Equation, Concept of Back EMF- applications - simple Problems.

UNIT 4: Transformers & Induction Machines (8 hours)

Single Phase Transformers: Principle of Operation, Constructional details, EMF equation, losses in transformers, regulation and efficiency,equivalent circuit - simple Problems.

Three phase Induction Motor: Construction and working principle, slip, rotor frequency, rotor current, and rotor power factor –simple Problems

UNIT 5: Electrical Installations (6 hours)

Components of LT Switchgear: Switch Fuse Unit (SFU), Miniature Circuit Breaker (MCB), Wires and Cables, Earthing. Batteries, Introduction to power converters.

Suggested Text / Reference Books

D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 2010.

D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill, 2009.

L. S. Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press, 2011.

E. Hughes, “Electrical and Electronics Technology”, Pearson, 2010.

V. D. Toro, “Electrical Engineering Fundamentals”, Prentice Hall India, 1989.

A. Chakarabarthi “Circuit Theory”, Dhanapath Roy & Co

Electrical Circuits – N. Sreenivasulu – Reem Publications

ENGINEERING GRAPHICS & DESIGN

(Common to CE, ME, EEE- II SEM)
(Common to ECE & CSE - I SEM)

Detailed contents:

Traditional Engineering Graphics:

Principles of Engineering Graphics; Orthographic Projection; Descriptive Geometry; Drawing Principles; Isometric Projection; Surface Development; Perspective; Reading a Drawing; Sectional Views; Dimensioning & Tolerances; True Length, Angle; intersection, Shortest Distance.

Computer Graphics:

Engineering Graphics Software; -Spatial Transformations; Orthographic Projections; Model Viewing; Co-ordinate Systems; Multi-view Projection; Exploded Assembly; Model Viewing; Animation; Spatial Manipulation; Surface Modeling; Solid Modeling; Introduction to Building Information Modeling (BIM)

(Except the basic essential concepts, most of the teaching part can happen concurrently in the laboratory)

Module 1: Overview of Computer Graphics

Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.

Module 2: Customization & CAD Drawing

Consisting of set up of the drawing page and the printer, including scale settings, Setting up of units and drawing limits; ISO and ANSI standards for coordinate dimensioning; Orthographic constraints, Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines, Applying various ways of drawing circles;

Module 3: Introduction to Engineering drawing

Principles of Engineering Graphics and their significance, usage of Drawing instruments, Conic sections including the Rectangular Hyperbola (General method only); Cycloid, Epicycloid, Hypocycloid and Involute.

Module 4: Orthographic Projections

Principles of Orthographic Projections-Conventions - Projections of Points and lines inclined to both planes; Projections of planes inclined Planes

Module 5: Projections of Regular Solids

Projections of solids inclined to both planes.

Floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, etc.

Module 6: Sections and Sectional Views of Right Angular Solids Sections of Prism, Cylinder, Pyramid and Cone

Development of surfaces of Right Regular Prism, Pyramid, Cylinder and Cone

Module 7: Isometric Projections

Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions;

Module 8: Annotations, layering & other functions

Applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines (extend/lengthen); Printing documents to paper using the print command; orthographic projection techniques.

Suggested Text/Reference Books:

Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House

Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education

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

(Corresponding set of) CAD Software Theory and User Manuals

Course Outcomes

The student will learn:

Introduction to engineering design and its place in society
Exposure to the visual aspects of engineering design
Exposure to engineering graphics standards
Exposure to solid modeling
Exposure to computer-aided geometric design
Exposure to creating working drawings
Exposure to engineering communication

ENGINEERING PHYSICS LAB

(Common to CE, ME, EEE- II SEM)

(Common to ECE & CSE - I SEM)

Course Description:

Physics Practical course is meant for making the students to gain practical knowledge to co relate with the theoretical studies. It covers experiments on Principles of Mechanics and Optics, Measurement of Magnetic field and studying Resonance using LCR Circuit.

Objectives:-

To explore the application of interference and diffraction by doing concerned experiments.
Elucidate the concepts of Physics through involvement in the experiment by applying theoretical knowledge.
Develop an ability to apply the knowledge of physics experiments in the later studies.
To understand the concept of energy gap, B-H curve, and synthesis of nano material by performing the experiments**.**

LIST OF EXPERIMENTS

Any 7 of the following experiments has to be performed in a semester:

Determination of wavelengths of various colours of mercury spectrum using diffraction grating in normal incidence method.
Determination of dispersive power of the prism.
Rigidity Modulus- Torsonal Pendulum.
Study of resonance effect in series and parallel LCR circuit.
Determination of thickness of thin object by wedge method.
Determination of radius of curvature of lens by Newton's Rings.
Laser : Determination of wavelength using diffraction grating.
Energy gap of a semiconductor using p-n junction diode.
Hysteresis: B-H curve.
Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
Frequency of the tuning fork - Melde's apparatus.
Spring constant - Coupled Pendulums.

Course Outcomes:

Upon successful completion of this course, the students should be able to:

Students can aware of the application of interference, diffraction phenomena along with laser.
Apply the scientific process in the conduct and reporting of experimental investigations.
Understand measurement technology, usage of new instruments and real time applications in engineering studies.
Verify the theoretical ideas and concepts covered in lecture by doing hands on in the experiments.
Know about the characteristics of various materials in a practical manner and gain knowledge about various optical technique methods.
Acquire and interpret experimental data to examine the physical laws.

Lab Manual: Laboratory Manual for Engineering Physics.

Mode of Evaluation: Continuous Internal Evaluation, Practical End Examination.

BASIC ELECTRICAL ENGINEERING LAB

(Common to CE, ME - II SEM)
(Common to ECE & CSE - I SEM)

List of Laboratory Experiments/Demonstrations:

Basic safety precautions. Introduction and use of measuring instruments – Voltmeter. Ammeter, Wattmeter, Multi-meter and oscilloscope.

Determination of values of R, L and C parameters of a given R-L-C series circuit

Verification of KCL and KVL.

Determination of Active, reactive and apparent power for R-L circuit (series & parallel).

Determination of Active, reactive and apparent power for R-C circuit (series & parallel).

Load test on 1-phase transformer.

OC & SC tests on 1-phase transformer to obtain equivalent circuit.

Torque-speed characteristics of DC shunt motor.

Speed Control of three –phase induction motors using pole changing method

Demonstration of cut out sections of DC & AC machines

Study of fuse, MCB, Batteries

WORKSHOP AND MANUFACTURING PRACTICES

(Common to CE, ME, EEE- II SEM)
(Common to ECE & CSE - I SEM)

Lectures & videos: (10 hours)
Detailed contents

Manufacturing Methods- casting, forming, machining, joining, advanced manufacturing methods **(3 lectures)**

CNC machining and Additive manufacturing **(1 lecture)**

Fitting operations & power tools **(1 lecture)**

Electrical &Electronics **(1 lecture)**

Carpentry **(1 lecture)**

Plastic molding, glass cutting **(1 lecture)**

Metal casting **(1 lecture)**

Welding (arc welding & gas welding) and brazing **(1 lecture)**

Text/Reference Books:

Hajra Choudhury S.K., Hajra Choudhury 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.

(Kalpakjian S. And Steven S. Schmid, ―Manufacturing Engineering and Technology‖, 4th edition, Pearson Education India Edition, 2002.

Gowri P. Hariharan and A. Suresh Babu,‖Manufacturing Technology – I‖ Pearson Education, 2008.

Roy A. Lindberg, ―Processes and Materials of Manufacture‖, 4th edition, Prentice Hall India, 1998.

Rao P.N., ―Manufacturing Technology‖, Vol. I and Vol. II, Tata McGrawHill House, 2017.

Course Outcomes:

Upon completion of this course

The students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.

Workshop Practice:(60 hours)

Machine shop (10 hours)

Fitting shop (8 hours)

Carpentry (6 hours)

Electrical (8 hours)

Welding shop (8 hours (Arc welding 4 hrs + gas welding 4 hrs)

Casting (8 hours)
Tin Smithy (6 hours)
Examinations could involve the actual fabrication of simple components, utilizing one or more of the techniques covered above.

S.NO	EXPERIMENTS IN THE SYLLABUS
	MACHINE SHOP
1	STEP TURNING OPERATION
2	TAPER TURNING OPERATION
	FITTING SECTION
1	SQUARE FITTING
2	STEEPED FITTING
	CARPENTRY SECTION
1	TEE HALVING JOINT
2	DOVETAIL TEE HALVING JOINT
	HOUSE WIRING SECTION
1	TO CONTROL TWO LAMPS BY ONE SINGLE WAY SWITCH(IN SERIES)
2	TO CONTROL TWO LAMPS BY ONE SINGLE WAY SWITCH(PARALLEL)
	WELDING SECTION
1	SINGLE V BUTT JOINT
2	LAP JOINT
	FOUNDRY SECTION
1	SINGLE PIECE SQUARE PATTERN
2	SINGLE PIECE ROUND PATTERN
	SHEETMETAL SECTION
1	SQUARE TRY
2	CYLINDER

Laboratory Outcomes:

Upon completion of this laboratory course, students will be able to fabricate components with their own hands.

They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.

By assembling different components, they will be able to produce small devices of their interest.

B. Tech II Semester Computer Science & Engineering

MATHEMATICS-II

(Common to All Branches)

Scheme	: 2018			
Internal Assessment	: 30	L	T	C
End Exam	: 70	**3**	**1**	**4**

Objectives:

To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following:

First order differential equations.
Linear differential equations with constant coefficients.
Laplace transforms in engineering problems.
Evaluate multiple integrals.
Understand Vector Calculus concepts and their applications.

Unit I: **First order ordinary differential equations:(10 Hours)**

Linear, Bernoulli equations, Exact and equations reducible to Exact. Applications: Orthogonal trajectories, Newton's law of cooling, Law of natural growth and decay.

Unit II: **Ordinary differential equations of higher order: (10Hours)**

Linear differential equations of second and higher order with constant coefficients – R.H.S term of the type e^{ax}, sinax, cosax, polynomials in x, e^{ax} V(x), xV(x) – Method of variation of parameters.

***Unit III*:Laplace transforms**: **(12Hours)**

Laplace transforms of standard functions – Properties of Laplace Transforms – Transforms of derivatives and integrals– Evaluation of integrals by Laplace transforms – Laplace transform of periodic functions. Convolution theorem. Inverse Laplace Transforms – Applications of Laplace transforms to ordinary differential equations.

Unit IV: **Multiple Integrals**:**(10Hours)**

Evaluation of double integrals in Cartesian coordinates and polar coordinates – Change of variables in double integrals – Change the order of integration in double integrals – Evaluation of triple integrals in Cartesian and polar coordinates – Change of variables in triple integrals.

Unit V: Vector calculus: (12Hours)

Vector differentiation: Scalar point function - Vector point function – Vector operator Del – Gradient – Divergence – Curl. Vector integration: Line, Surface and Volume integrals. Green's

theorem in a plane, Stoke‘s theorem and Gauss-divergence theorems (Statements only). Applications of Green‘s, Stoke‘s and Gauss divergence theorems.

Text Books:

Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-43 edition 2014.

Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 9^{th} edition-2013

Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9^{th} Edition, Reprint, 2002.

Reference Books:

Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11^{th} Edition, Reprint 2010.

A Text Book of Engineering Mathematics, N.P. Bali and Manish Goyal, Lakshmi Publications, Reprint 2008.

Outcomes:

On completion of course Students are able to

Solve the first order differential equations.

Solve linear differential equations with constant coefficients.

Apply Laplace Transforms in engineering problems.

Evaluation of multiple integrals.

Understand Vector Calculus concepts and their applications.

ENGINEERING CHEMISTRY

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Objectives:

Knowledge in Chemistry serves as basic nutrient for the understanding and thereby design of materials of importance in life. Thus the advancement in Engineering depend on the outcome of basic sciences.

The Engineering Chemistry course for undergraduate students is framed to strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial! Engineering applications.

The course main aim is to impart in-depth knowledge of the subject and highlight the role of chemistry principles (or) applications in the field of engineering.

An attempt has been made to logically correlate the topic with its application.

After the completion of the course, the student would understand about the concepts of chemistry .

Module-1 : Atomic and molecular structure

Schrodinger wave equation. Particle in a box(one dimensional) and their applications .Molecular orbitals of diatomic molecules and plots of the multicenter orbitals. Equations for atomic and molecular orbitals. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.

Module-2: Periodic properties

Effective nuclear charge, penetration of orbitals, variations of s, p, d and f orbital energies of atoms in the periodic table, electronic configurations, atomic and ionic sizes,ionization energies, electron affinity and electronegativity, polarizability, oxidation states, coordination numbers and geometries, hard, soft acids and bases.

Module-3:

Intermolecular forces

Ionic, dipolar and van Der Waals interactions. Equations of state of real gases and critical phenomena.

Use of free energy in chemical equilibria

Thermodynamic functions: Introduction, define energy, entropy , Free energy.Free energy and emf.Cell potentials, the Nernst equation and applications.Water chemistry-types of water and Boiler troubles. Corrosion-types of corrosion and factors influencing corrosion.

Module-4: Spectroscopic techniques and applications

Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules.

Module-5:

Stereochemistry

Representations of 3 dimensional structures, structural isomers and stereoisomers,configurations and symmetry and chirality, enantiomers, diastereomers,optical activity,absolute configurations and conformational analysis of Cyclohexane.

Simple Organic Reactions

Introduction to reactions involving Substitution(SN^1 &SN^2), Addition Reactions involving C=C(Markonikoffreaction)&C=O(Grignardreagent),Elimination(E_1&E_2) Oxidation(Baeyer villiger reaction),Reduction(Clemmensen reduction).

Suggested Text Books

Engineering Chemistry, Satyaprakash, Khanna Book Publishing, Delhi

A Text Book of Engg. Chemistry, Shashi Chawla, Dhanpat Rai & Co. (P) Ltd.

Essentials of Physical Chemistry, Bahl&Tuli, S.Chand Publishing

Applied Chemistry, Sunita Rattan, Kataria

Engineering Chemistry, Baskar, Wiley

6. . Engineering Chemistry – I, D. GrourKrishana, Vikas Publishing

7. . Laboratory Manual Engg. Chemistry, Anupma Rajput, Dhanpat Rai & Co.

Course Outcomes

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:

Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.Rationalise bulk properties and processes using thermodynamic considerations. Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques. Rationalise periodic properties such as ionization potential, electronegativity,oxidation states and electronegativity. List major chemical reactions that are used in the synthesis of molecules.

ENGLISH

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

1. Vocabulary Building

1.1 The concept of Word Formation

1.2 Root word from foreign languages and their use in English

1.3 Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives

1.4 Synonyms, antonyms

1.5 Idioms and phrases.

2. Basic Writing Skills

2.1 Sentence Structures

2.2 Use of phrases and clauses in sentences

2.3 Importance of proper punctuation

2.4 Creating coherence

2.5 Organizing principles of paragraphs in documents

2.6 Techniques for writing precisely

3. Transformation

3.1 Interchange of parts of speech

3.2 Active voice and Passive voice

3.3 Direct and Indirect speech

3.4 3.4Degrees of comparison

3.5 3.5Simple, compound and complex sentences

Identifying Common Errors in Writing

4.1 Subject-Verb agreement

4.2 Noun-pronoun agreement

4.3 Misplaced modifiers

4.4 Articles

4.5 Prepositions

4.6 Redundancies

4.7 Clichés

4.8 Tenses

Reading and Writing Practices

5.1 Comprehension

5.2 Précis Writing

5.3 Essay writing

5.4 Essay writing

PROGRAMMING FOR PROBLEM SOLVING

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Course Objectives

The course aims to provide exposure to problem-solving through programming
It aims to train the student to the basic concepts of the C programming language

Course Outcomes

The student will learn

To formulate simple algorithms for arithmetic and logical problems and to translate the algorithms to programs (in C language).
Choose the loops and decision making statements to solve the problem.
To implement different Operations on arrays.
To use functions to solve the given problem.
To understand structures, unions and pointers,

UNIT 1:

Introduction to Computers: - Introduction, computer hardware and software, creating and running programs, software development life cycle, algorithms, flowcharts.

Introduction to C programming: - Overview of C, structure of a C program, variables, constants, data types, identifiers, keywords, Input/output statements in C, programming examples.

UNIT 2:

Operators and Expressions:- Operators, expressions, precedence and associativity, evaluating expressions, type conversion, typedef, enumerations.

Decision making statements:if statement, if-else statement, nested if-else statement, switch statement.

Loops in C: while loop, for loop, do-while loop, nested for loops,

Jumping statements:break, continue and goto statements.

UNIT 3:

Arrays: Introduction, Declaration and initialization of 1D and 2D arrays.

Array applications: -bubble (exchange) sort, selection sort, linear search, binary search.

Strings: -Definition, declaration and initialization of strings, string I/O functions,string handling functions,array of strings (table of strings).

UNIT 4:

Functions: introduction, category of functions, parameter passing methods, storageclasses, recursivefunction.

Pointers: Understandingpointers, declaring and initialization of pointer variable, accessing the address of variables, accessing a variable through its pointer, chain of pointers.

UNIT 5:

Structures and union: Introduction, defining a structure, declaring structure variable, structure initialization, accessing members of structure, copying and comparing structure variables, structures within structures, array of structures, and introduction of union.

TEXT BOOKS

E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGraw Hill.
Rema Theraja, Programming in C, second edition, Oxford.

REFERENCE TEXT BOOKS

Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
R.G. Dromey, How to solve it by Computer, Pearson.
Yashavant Kanetkar, Let us C, 15th edition, BPB Publications.
Dr. P. ChennaReddy, Computer Fundamentals and C Programming, Second Edition.

CHEMISTRY LAB

(Common to CE, ME, EEE- I SEM)

(Common to ECE & CSE - II SEM)

Choice of experiments from the following:

1.Estimation of Hardness of Water present in given water sample by EDTA method.

Determination of surface tension and viscosity.

3. Determination of chloride content of water.

4.Colligative properties using freezing point depression.

5.Estimation of Dissolved Oxygen present in given water sample by Winkler‘s method.

6.Potentiometry - determination of Redox potentials and emfs.

7.Synthesis of a polymer/drug.

8.Saponification/acid value of an oil.

Determination of cell constant and conductance of solutions.. 10.Chemical oscillations- Iodine clock reaction.

11.Determination of the partition coefficient of a substance between two immiscible liquids.

12. Adsorption of acetic acid by charcoal.

Laboratory Outcomes

The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering.

The students will learn to:

Estimate rate constants of reactions from concentration of reactants/products as a function of time. Measure molecular/system properties such as surface tension, viscosity,conductance of solutions, redox potentials, chloride content of water, etc.

- Synthesize a small drug molecule and analyse a salt sample.

PROGRAMMING FOR PROBLEM SOLVING LAB

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Laboratory Objectives

To impart knowledge so that the student will

know how to write and debug programs

know the principles of designing structured programs

Know when and how to use the appropriate statements available in the C language.

Write basic C programs using, Selection statements, Repetitive statements, Functions, Pointers, Arrays, Strings and structures

Laboratory Outcomes

To formulate the algorithms for simple problems

To translate given algorithms to a working and correct program

To be able to correct syntax errors as reported by the compilers

To be able to identify and correct logical errors encountered at run time

To be able to write iterative as well as recursive programs

To be able to represent data in arrays, strings and structures and manipulate them through a program

To be able to create, read and write to and from simple text files.

The student is expected to solve at least 12 assignments from different concepts. (Every year 12 different experiments).

DOS commands, Algorithms, Flowcharts and sample C programs

Practice DOS commands necessary for design of C programs.

Design and develop algorithms and flowcharts for simple and logical problems

If the total selling price of 15 items and total profit earned on them is input through the keyboard. Write a C program to find the cost price of one item.

Ramesh‘s basic salary is input through the keyboard. His dearness allowance is 40% of basic salary and house rent allowance is 20% of basic salary. Write a C program to calculate his gross salary.

The distance between two cities (in km) is input through the keyboard. Write a C program to convert and print the distance in meters, centimetres, inches and feet.

Write a program to take input of name, roll no and marks obtained by a student in 5 subjects each have its 100 full marks and display the name, roll no with percentage score secured.

Problems involving if-then-else structures

Write a C program to find out whether a given number is even number or odd number.

Write a C program to check whether a given year is leap year or not.

Design and develop an algorithm that takes three coefficients (***a***, ***b***, and ***c***) of a Quadratic equation ($ax^2+bx+c=0$) as input and compute all possible roots. Implement a C program for the developed algorithm and execute the same to output the possible roots for a given set of coefficients with appropriate messages.

If the ages of the Ramesh, Suresh and Mahesh are input through the keyboard, write a C program to determine youngest of the three.

A character is entered through keyboard. Write a C program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol using if-else and switch case. The following table shows the range of ASCII values for various characters.

Characters	**ASCII values**
A – Z	65 – 90
a – z	97 – 122
0 – 9	48 – 57
Special symbols	0 – 47, 58 – 64, 91 – 96, 123 – 127.

A library charges fine for every book returned late. For first five days the fine is 50 paisa, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a C program to accept the number of days that the member is late to return the book and display the fine or appropriate message.

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).

Problems involving Looping statements

If the sum of the cubes of each digit of a number is equal to the number itself, then the number is called Armstrong number. (for example, $153 = 1^3+5^3+3^3$). Design and develop an algorithm to find whether a given number is Armstrong number or not. Implement a C program for the developed algorithm.

Design and develop an algorithm to find the square root of a given number ***N***. Implement a C program for the same and execute for all possible inputs with appropriate messages. Note: **Don't use library function *sqrt(n)*.**

If a number and its reversed number are same then the number is called as palindrome number. Design and develop an algorithm to check whether a given number is palindrome or not. Implement a C program for the same.

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

Write a C program to evaluate the sin(x) function series

$$= \frac{}{} - \frac{}{} + \frac{}{} - \frac{}{} + \cdots$$

Fibonacci Sequence

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 program to generate the first N terms of the sequence.

Arrays

Write a C program to find the smallest and largest number in a given array.

Write a C program to find the frequency of a particular number in a list of integers.

Write a C program to sort the list of elements using

e) Bubble Sort b) Selection sort.

23. Write a C program to search for an element in a list of elements using

e) Linear search b) Binary search

Write a C program to find the transpose of a matrix.

Write a C program to read two matrices and perform the following operations

Addition of two matrices
Multiplication of two matrices

Additional Problems on arrays

Partitioning an array

Given a randomly ordered array of n elements, write a C program to partition the elements into two subsets such that elements $\leq X$ are in one subset and elements $\geq X$ are in another subset.

Finding the k^{th} smallest element

Given a randomly ordered array of n elements, write a C program to determine the k^{th} smallest element.

Array order reversal

Write a C program to rearrange the elements in an array so that they appear in reverse order.

Strings

If a string and its reversed string are same then the string is called as palindrome string. Design and develop an algorithm to check whether a given string is a palindrome or not and implement a C program for the same.

Write a C program to sort the names of students in a class in alphabetical order.

Additional Problems on strings

Write a C program to read two strings and perform the following operations without using built string library functions.

- String length
- String reversing
- Comparison of two strings
- Concatenation of two strings

Write a C program to count the number of vowels, consonants, digits, blank spaces and special characters in a given string.

Functions and Recursion

Write a C program to swap the contents of two variables using

- Call by value
- Call by reference.

Write a C program using recursion to

- Find the factorial of a given number
- Print the Fibonacci series up to a given number.
- Find the GCD of two integers.

Structures

Write a C program to define a structure with the following members.

Roll No., Name, marks in Sub1, Sub2, Sub3. Read the n students records and find the total marks of each student and print the result in the following format.

Roll No	Name	Sub1	Sub2	Sub3	Total marks	result
189Y1A0501	Kavya	80	70	75	225	Distinction

Files

36. Write a C program to copy the contents of one file to another file.

TEXT BOOKS

Yashavant Kanetkar, Let us C, 15th edition, BPB publications.

E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGraw Hill.

R.G. Dromey, How to solve it by Computer, Pearson.

ENGLISH LAB

(Common to CE, ME, EEE- I SEM)
(Common to ECE & CSE - II SEM)

Oral Communication

(This unit involve interactive practice sessions in Language Lab)

- Listening Comprehension ----- Language Lab
- Pronunciation, Intonation, Stress and Rhythm ----- Language Lab

Common Everyday Situations: Conversations and Dialogues ------ Communication Lab

Communication at workplace ------ Communication Lab

• Interviews ------ Communication Lab • Formal Presentations

------ Communication Lab

Annexure-3 Guidelines for Internal Assessment

The following guidelines shall apply for internal assessment of theory subjects A3.1. Purpose

The purpose of internal assessment is to engage students in continuous learning A3.2. Guidelines

Allocation: For theory subjects the total internal assessment marks is 30 of which 25 marks are assessed thorough midterm tests and 5 marks by assignments

Assignments: The assignments shall aid and hone the daily routine of students. Assignments shall be stimulating and thought provoking to the student. While some questions may test student's understanding of the subject, there shall be questions that imply connect to real world applications. A variety of questions can posed in assignments

Number: A minimum of four assignments shall be given in each subject with one assignment from Unit I to IV of syllabus of that subject

Quantum of work: An assignment shall take about four to six hours of study/work per week. Assignments shall not be overloaded nor under loaded. As a guideline, each assignment may contain five questions, each question taking an hour to answer

Marks: Each assignment must be evaluated for fifty marks. Final marks is obtained by averaging all the assignment marks and reducing it to five marks

Deadlines: Students shall be given at least one-week time to complete and submit assignments. Assignments shall be submitted within deadline. Late submissions should be awarded zero marks

General: It is advised to administer assignments using Google Classroom

Midterm tests:Midterm tests shall check students' understanding and application concepts learned in the subjects. Performance in these tests is a direct measure the course outcomes (COs)

Number and duration: There shall be two midterm tests each with a duration of two hours. Time duration for objective part is 20 minutes and that for subjective part is 100 minutes

Format of test and division of marks: Internal test shall consist of two parts: objective part for 5 marks and subjective part for 20 marks

Objective part: Objective part shall contain twenty objective questions. The type of questions can be multiple choice, fill the blank, matching etc.

Subjective part: Subjective part shall contain four questions and all questions shall be answered. However, each question can have internal choice (either or type question). Generally, each question shall test one course outcome (CO)

Syllabus: Each test shall cover 50% of the syllabus, approximately