ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES

RAJAMPET - 516126

(AUTONOMOUS)

www.aitsrajampet.ac.in

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC REGULATIONS (R17)

AND

COURSE STRUCTURE & SYLLABI

For the students admitted to

B. Tech., Regular Four Year Degree Programme in CBCS

from the Academic Year 2017-18

and

Regulations & Course Structures for

B. Tech., Lateral Entry Scheme from the Academic Year 2018-19

B. Tech., ELECTRICAL AND ELECTRONICS ENGINEERING

VISION AND MISSION OF THE INSTITUTION

Vision

We impart futuristic technical education and instill high patterns of discipline through our dedicated staff who set global standards, making our students technologically superior and ethically strong, who in turn shall improve the quality of life of the human race.

Mission

Our mission is to educate students from the local and rural areas, and from other states so that they become enlightened individuals, improving the living standards of their families, industry and society. We provide individual attention, world-class quality of Technical education and take care of character building.

VISION AND MISSION OF THE DEPARTMENT

Vision

We envision the Department as one of the best in the region with a stimulating environment to make an impact on, and lead in the field through its Education and Research

Mission

The mission of the Department is to provide an excellent and comprehensive education in the field of Electrical and Electronics Engineering which in turn mould students for a wide range of careers and to exhibit a high level of professionalism, ethical behavior and social responsibility

Program Educational Objectives (PEOs)

The B.Tech., Electrical & Electronics Engineering graduates will be able to:

PEO1: To experience success in Electrical & Electronics Engineering and other diverse fields that requires analytical and technical skills

PEO2: To prepare students to identify and implement global, societal needs and constraints in designing new technology/product and follow professional ethics

PEO3: To inculcate in students professional attitude, effective communication skills and leadership qualities to succeed in multi-disciplinary teams

PEO4: To promote students to pursue professional development by continuous learning relevant to their career

Program Outcomes (POs)

A graduate of Electrical & Electronics Engineering will have ability to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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ACADEMIC REGULATIONS
B. Tech, Four Year Degree Programme with CBCS
(For the batches admitted from the academic year 2017-18)
and
B. Tech. Lateral Entry Scheme
(For the batches admitted from the academic year 2018-19)

The following rules and regulations will be applicable for the batches of Four year B.Tech. degree admitted from the academic year 2017-18 onwards.

1 ADMISSION:

1.1 Admission into First year of Four year B. Tech. Degree programme of study in Engineering:

As per the existing stipulations of Andhra Pradesh State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made into the first year of four year B. Tech. Degree programme as per the following pattern.

a) Category-A seats will be filled by the Convener, AP-EAMCET.
b) Category-B seats will be filled by the Management as per the norms stipulated by Govt. of Andhra Pradesh.

1.2 Admission into the Second Year of Four year B.Tech. Degree programme (lateral entry).

As per the existing stipulations of Andhra Pradesh State Council of Higher Education (APSCHE), Government of Andhra Pradesh. Seats will be filled by the Convener, AP-ECET.

2 PROGRAMMES OF STUDY OFFERED BY AITS LEADING TO THE AWARD OF B. TECH. DEGREE:

Following are the four year Under Graduate Degree Programmes of study offered in various disciplines at Annamacharya Institute of Technology and Sciences, Rajampet leading to the award of B.Tech. (Bachelor of Technology) Degree:

1. B.Tech. (Computer Science and Engineering)
2. B.Tech. (Electrical and Electronics Engineering)
3. B.Tech. (Electronics and Communication Engineering)
4. B.Tech. (Mechanical Engineering)
5. B.Tech. (Civil Engineering)

and any other programme as approved by the concerned authorities from time to time.

3 ACADEMIC YEAR:

The entire course of study is of four academic years and each year will have **TWO** Semesters (Total **EIGHT** Semesters). The minimum instruction days for each semester shall be 90.

4 COURSE STRUCTURE:

Each programme of study shall consist of:

4.1 General Courses comprising of the following :(5 to 10%)

a) Language / Communication Skills
b) Humanities and Social Sciences : Environmental Science
c) Economics and Accounting
d) Principles of Management

4.2 Basic Science Courses comprising of the following: (15 to 20%)

a) Computer Literacy with Numerical Analysis
b) Mathematics
c) Physics
d) Chemistry

4.3 Basic Engineering Courses comprising of the following (depending on the branch):(15 to 20%)

a) Engineering Drawing
b) Engineering and IT Workshop
c) Engineering Mechanics
d) Basic Mechanical Engineering
e) Electrical and Electronics Engineering
f) Basic Civil Engineering
g) Computer Programming

4.4 Compulsory Discipline Courses :(30 to 40%)

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

4.5 Professional subjects - Electives: (10 to 15%)

Electives will be offered to the students to diversify the spectrum of knowledge, based on the interest of the student to broaden his individual skill and knowledge.

4.6 Open Electives: (5 to 10%)

Open subjects will be offered from other technical and / or emerging subject areas

4.7 Project Work, Seminar and /or Internship :(10-15%)

Project Work, Seminar and /or Internship in industry or elsewhere.

4.8 Mandatory Courses:

Environmental Studies, Technical English and professional communication & Soft Skills are included as subjects under mandatory courses but with credit weightage.

4.9 There shall be a subject like comprehensive Electrical and Electronics Engineering with 2 hours per week introduced in final year first semester.

4.10 Every programme of study shall be designed to have 42-44 theory courses and **22- 28** laboratory/seminar/comprehensive courses.

4.11 Every programme has included foundation courses to the extent of 30%, programme core and programme elective subjects to the extent of 60%,open electives and mandatory courses to the tune of 10% approximately of the total credits.

4.12 Audit Courses (to be included in **I B. Tech. II Semester and III B. Tech. I Semester**):

Interested students who want to supplement their knowledge can opt for audit courses namely Professional Ethics/Stress Management & Advanced English Communication laboratory and can appear/Pass in Continuous Internal Evaluation and Semester End Examination of these courses, will be included in marks memo only when they pass.

4.13 Open Elective:

IV Year I Semester student has to necessarily select a subject from the list of open electives.

4.14 Contact Hours: Depending on the complexity and volume of the course, the number of contact hours per week will be assigned.

5 CREDIT SYSTEM:

Credits are assigned based on the following norms.

	Semester Pattern	
	Period(s) / Week	Credit(s)
Theory	01	01
Practical	**03**	**02**
Comprehensive Course	**02**	**02**
Seminar	**–**	**01**
Final Year Project	12	08

6 EXAMINATION SYSTEM: All components in any programme of study will be evaluated continuously through internal evaluation and an external evaluation component conducted as semester-end examination.

6.1 **Distribution of Marks:**

S. No.	Description	Marks	Examination and Evaluation	Scheme of Evaluation
1	Theory	70	Semester-End Examination.	The question paper shall be of subjective type with **Five** questions with internal choice to be answered in 180 Minutes duration.
		30	Mid-Examinations of 120 Minutes duration to be evaluated for 20marks. The question paper shall be of subjective type in which four questions with an internal choice are to be answered. Remaining 10 marks is for continuous evaluation which includes weekly/ fortnightly class tests, homework assignments, problem solving, group discussions, quiz, seminar, mini-project and other means. The method of allotting these marks will be decided by the teacher dealing that subject in consultation with the Head of the Department. Teacher has to announce the evaluation method in the beginning of the semester.	**Two** MID - Examinations are to be conducted for 20 marks each in a semester. 80% weightage for better performance and 20% for other shall be considered. **MID-I:** after first spell of instructions (I & II-Units). **MID-II:** after second spell of instructions (III, IV&V-Units). The student who has missed both the Mid examinations will be permitted to appear for a substitute examination covering the total syllabus. This substitute examination will be given a weightage of 80%. This is to be conducted before the commencement of end semester exams, can be even outside the working hours, can be even two mid exams a day also.

S. No.	Description	Marks	Examination and Evaluation	Scheme of Evaluation
2	Laboratory or Drawing	70	Semester - End Lab Examination	**For laboratory courses: 180 minutes** duration – two examiners. For Drawing and /or Design: like for the theory examination.
		30	**20 Marks** for Day to Day evaluation	Performance in laboratory experiments
			10 Marks for Internal evaluation	Performance of one best out of two tests to be considered.
3	Seminar	100	**Internal Evaluation:** 20 Marks for Report 20 Marks for subject content 40 Marks for presentation 20 Marks for Question and Answers	Continuous evaluation during a semester by the Departmental Committee (DC) consisting of two/three faculty members allotted by Head of the Department.
4	Comprehensive Course	100	The marks can be allotted based on the performance in viva-voce conducted by Head of the department and two senior faculty members in the department.	
5	Project Work	100	70 Marks for External evaluation	Semester-End Project Viva-Voce examination by Committee as detailed under 6.2
			30 Marks for Internal evaluation	Continuous evaluation by the DC 15 Marks by DC as detailed under 6.2.1 15 Marks by Supervisor

6.2 Project Work Evaluation:

6.2.1 The Internal Evaluation shall be made by the Departmental Committee, on the basis of average of two seminars presented by each student on the topic of his project, the best one to be considered. The presentations shall be evaluated by the Departmental Committee (DC) consisting of Head of the Department, supervisor and a senior faculty member.

6.2.2 The Semester-End Examination (viva-voce) shall be conducted by a Committee consisting of External examiner nominated by the Chief Controller of Examinations, HOD and Supervisor. The evaluation of project work shall be conducted at the end of the IV year II Semester.

6.3 Eligibility to appear for the Semester-End examination:

6.3.1 A student shall be eligible to appear for end examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in the semester.

6.3.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted by the Institute Academic Committee if the reason for shortage is convincing.

6.3.3 Shortage of Attendance below 65% in aggregate shall in no case be condoned.

6.3.4 A stipulated fee shall be payable towards condonation of shortage of attendance to the Institute as per following slab system

1stSlab: Less than 75% attendance but equal to or greater than 70% a normal condonation fee can be collected from the student.

2ndSlab: Less than 70% but equal to or greater than 65%, double the condonation fee can be collected from the student.

6.3.5 Students whose shortage of attendance is not condoned in any semester are not eligible to take their End Examination of that class and their registration for that semester shall stand cancelled.

6.3.6 A student will not be promoted to the next semester unless he satisfies the attendance requirements of the current semester, as applicable.

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

6.4 Revaluation / Recounting:

Students shall be permitted to request for recounting/ revaluation of the end theory examination answer scripts within a stipulated period after payment of prescribed fee.

After recounting or revaluation, records are updated with changes if any and the student will be issued a revised memorandum of marks. If there are no changes, the student shall be intimated the same through a letter or a notice.

6.4.1 **Challenge valuation**

Student can apply challenge valuation by paying Rs.10,000 per subject, the photo copy of the answer booklet shall be given to the student on notified date.

- If the improvement is 15% of max marks or more, the new marks will be awarded to the student. Otherwise there will be no change in the old marks
- If the improvement is 15% of max marks or more an amount of Rs 9,000 will be refunded to the student. If the student's status changes from fail to pass, an amount of Rs 5000 will be refunded to the student. Otherwise the student will forfeit the amount which he/she paid.
- No challenge valuation for Laboratory Examination.

6.4.2 **Improvement of Marks:**

Students are permitted for improvement examinations once for a maximum of four subjects after completion of the study course but before applying for provisional certificate and consolidated marks memo after payment of prescribed fee.

6.5 Readmission of Students:

A student who has satisfied the minimum attendance requirement in any semester may repeat that semester, after obtaining written permission from the Principal and cancelling the previous record of attendance and academic performance (viz; internal evaluation and external evaluation marks) of the semester or year. This facility may be availed by any student at the maximum twice for a 4 year B. Tech., and only once by Lateral Entry student & PG student during the entire course of study.

6.6 Supplementary Examination:

6.6.1 All Regular examinations are understood as Regular/Supplementary examinations. The supplementary students have to appear for the supplementary examinations along with their regular examinations conducted at the end of each semester. However, separate supplementary examinations will be conducted for the II-Semester subjects at the end of I-Semester and vice-versa.

6.6.2 In case of Seminars and Comprehensive Viva-Voce examinations, supplementary seminar / comprehensive Viva-Voce will be conducted along with the next batch of students if available. If the next batch of students is not available, a separate supplementary examination will be conducted.

6.7 Internship Programme:

The weightage of one credit given for an internship of three weeks duration and more, when a student undergoes internship / industrial training from the Specified Industries / Research Organizations / Universities. In such a case, the student has to submit a report on that internship which will be evaluated by a team of three faculty members (decided by the HOD) of the department for those two credits. Student is

given a chance to drop one seminar in place of a successful internship / industrial training.

6.8 Massive Open Online Course (MOOC):

MOOC is one of the courses introduced in IV year I semester. The list of subjects under MOOC will be intimated before commencement of class work.

7 ACADEMIC REQUIREMENTS FOR PROMOTION/ COMPLETION OF B. Tech., PROGRAMME OF STUDY:

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

7.1 For students admitted into B.Tech. (Four Year) programme:

7.1.1 A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, drawing subject if he secures not less than 35% of marks in the End Examination and a minimum of 40% of marks in the sum total of the Internal Evaluation and End Examination taken together.

7.1.2 For promotion from I B.Tech.to II B.Tech. a student must satisfy the attendance requirements in I year (two semesters).

7.1.3 A Student shall be promoted from II year to III year, if he fulfills the academic requirements of securing a minimum of **50** credits from I year I and II-Semesters, II year I and II-Semesters examinations conducted till that time.

7.1.4 A student shall be promoted from III year to IV year if he / she fulfill the academic requirements of securing a minimum of **74** credits from I year I and II-Semesters, II year I and II-Semesters and the III year I and II- Semester examinations conducted till that time.

7.1.5 A student shall register for all the subjects and earn all the**195**credits. Marks obtained in all the credits shall be considered for the calculation of the class based on CCPA.

7.1.6 A student who fails to earn all the **195** credits as indicated in the course structure within **Eight** academic years from the year of admission shall forfeit his seat in B.Tech. Programme and his admission stands cancelled.

7.2 For Lateral Entry Students (batches admitted from 2018-2019):

7.2.1 Academic requirements for pass in a subject are the same as in 7.1.1 and attendance requirements as in 6.3.

7.2.2 A student shall be promoted from II year to III year if he fulfills the academic requirements of securing a minimum of **22** credits from II year I and II-Semesters examinations conducted till that time.

7.2.3 A student shall be promoted from III year to IV year if he fulfills the academic requirements of securing a minimum of **46** credits from II year I and II-Semesters and the III year I and II-Semester examinations conducted till that time.

7.2.4 A student shall register for all the subjects and earn all **143** credits. Marks obtained in all such credits shall be considered for the calculation of the class based on CCPA.

7.2.5 A student who fails to earn all the **143** credits as indicated in the course structure within **six** academic years from the year of his admission shall forfeit his seat in B.Tech. Programme and his admission stands cancelled.

8 TRANSITORY REGULATIONS:

Students who got detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work for the next batch or later batches with the same (or) equivalent subjects as and when subjects are offered and they continue to be in the academic regulations of the batch he is joining later.

9 CREDIT POINT AVERAGE (CPA) AND CUMULATIVE CREDIT POINT AVERAGE (CCPA):

9.1 **For a Semester:**

Credit Point Average [CPA] $= \frac{1}{10} \frac{\sum_i C_i T_i}{\sum_i C_i}$

Where C_i= Credits earned for Course i in any semester,

T_i= Total marks obtained for course i in any semester.

9.2 **For the entire programme**:

Cumulative Credit Point Average [CCPA] $= \frac{1}{10} \frac{\sum_n \sum_i C_{ni} T_{ni}}{\sum_n \sum_i C_{ni}}$

Where *n*= the semester in which such courses were credited

9.3 **Overall Performance:**

CCPA	Classification of final result
7.0 & above	First class with distinction
6.0 & above but below 7.0	First class
5.0 & above but below 6.0	Second class
4.0 & above but below 5.0	Pass

10 TRANSCRIPTS:

After successful completion of the entire programme of study, a transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued, if required, after payment of requisite fee. Partial transcript will also be issued up to any point of study to a student on request.

11 ELIGIBILITY:

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

(i) Registered and successfully completed all the components prescribed in the programme of study to which he is admitted.

(ii) Successfully acquired all **195/139 credits** as specified in the curriculum corresponding to the branch of study within the stipulated time.

(iii) No disciplinary action is pending against him.

12 AWARD OF B.TECH DEGREE:

12.1 A student is permitted to select one of the extracurricular / extension activities like NSS / Sports / Games / Cultural activities. A certificate in one of these activities is a must for the student to become eligible for the award of Provisional Certificate or Degree. It is resolved that a certificate of participation to the extent of 65% attendance is enough for the students to become eligible for the award of degree.

12.2 The B.Tech. Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Ananthapuramu on the recommendations of the Principal of Annamacharya Institute of Technology and Sciences, Rajampet.

13 AMENDMENTS TO REGULATIONS:

The chairman, Academic Council of Annamacharya Institute of Technology and Sciences, Rajampet reserves the right to revise, amend, or change the Regulations, Scheme of Examinations, and / or Syllabi or any other policy relevant to the needs of the society or industrial requirements etc., without prior notice.

14 Any legal issues are to be resolved in Rajampet Jurisdiction.

15 GENERAL:

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

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CURRICULUM STRUCTURE

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES:: RAJAMPET

(AN AUTONOMOUS INSTITUTION)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Regulations: **R17** Programme Code: **G2**

I Year B.Tech. I Semester

Subject Code	Subject Name	Hours / Week			C
		L	T	P	
7GC11	Technical English& Professional Communication	4	1	0	4
7GC13	Engineering Physics	3	1	0	3
7GC14	Engineering Mathematics-I	4	1	0	4
7G111	Problem solving Techniques & C programming	3	1	0	3
7G311	Fundamentals of Electrical & Electronics Engineering	4	1	0	4
7G515	Engineering & IT workshop	--	--	3	2
7G112	Programming in C Lab	--	--	3	2
7GC16	Engineering Physics lab	--	--	3	2
7G312	Fundamentals of Electrical & Electronics Engineering Lab	--	--	3	2
	Total	**18**	**5**	**12**	**26**

I Year B. Tech. II Semester

Subject Code	Subject Name	Hours / Week			C
		L	T	P	
7G121	Data Structures	3	1	--	3
7GC22	Engineering Chemistry	3	1	--	3
7G523	Geometrical Drawing	2	--	5	4
7GC24	Engineering Mathematics-II	4	1	--	4
7G321	Electronic devices and circuits	4	1	--	4
7G124	Programming in Data Structures Lab	--	--	3	2
7G322	Electronic devices and circuits lab	--	--	3	2
7GC27	English Language Communication Skills Lab	--	--	4	2
7GC25	Engineering Chemistry lab	--	--	3	2
AUDIT COURSE	Gender Sensitization	2	--	--	--
	Total	**18**	**4**	**18**	**26**

Note: L - Lecture; T-Tutorial; P – Practical; C – Credits

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AN AUTONOMOUS INSTITUTION)

Regulations: - **R17**

II Year B. Tech. I Semester

Subject Code	Subject Name	Hours / Week			C
		L	T	P	
7GC32	Engineering Mathematics-III	3	1	--	3
7G231	DC Machines	3	1	--	3
7G232	Switching Theory and Logic design	3	1	--	3
7G334	Analog Electronics-I	3	1	--	3
7G233	Electrical Circuits-I	3	1	--	3
7G536	Fluid Mechanics & Hydraulic Machines	3	1	--	3
7G235	Electrical Circuits Lab	--	--	3	2
7GC34	Advanced English Language Communications Skills Lab	--	--	3	2
7G53B	Fluid Mechanics & Hydraulic Machines Lab	--	--	3	2
7G237	Seminar-I	--	--	2	1
	Sports and Extension Activities	--	--	1	--
	Total	**18**	**6**	**12**	**25**

II Year B. Tech. II Semester

Subject Code	Subject Name	Hours / Week			C
		L	T	P	
7GC43	Complex variables and special Functions	3	1	--	3
7G241	AC machines-I	3	1	--	3
7G345	Analog Electronics -II	3	1	--	3
7G242	Electromagnetic Fields	3	1	--	3
7G243	Linear Control Systems	3	1	--	3
7G244	Electrical Circuits-II	3	1	--	3
7G349	Analog Electronics Lab	--	--	3	2
7G245	DC Machines Lab	--	--	4	2
7G247	Simulation of Electrical & Electronics Lab	--	--	3	2
7GC44	Aptitude and Reasoning Skills	--	2	--	1
	Sports and Extension activities	--	--	1	--
	Total	**18**	**8**	**10**	**25**

Note: L - Lecture; T-Tutorial; P – Practical; C – Credits

I Year B.Tech. I Semester

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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I Year B. Tech. I Semester

(7GC11) TECHNICAL ENGLISH & PROFESSIONAL COMMUNICATION

(Common to all branches)

Course Objectives:

- To improve the language proficiency of the students in English with respect to accuracy and fluency
- To enable the students to acquire comprehension skills to study academic subjects with greater felicity
- To develop English communication skills of the students in formal and informal situations
- To enable the students to gain familiarity with the dynamics of communication, stumbling blocks in communication

UNIT I

Sure Outcomes: Technology with a Human Face

Grammar: Kinds of Verbs and their Use; Writing: Official Letters; Vocabulary: Synonyms and Antonyms, Prefixes and Suffixes, Idioms and Phrases

Technical Communication: Features; Distinction between General and Technical communication; Language as a tool of communication; Elements of Human Communication

UNIT II

Sure Outcomes: Climatic Change and Human Strategy

Grammar: Tenses; Writing: Letters of Application; Vocabulary: One-word Substitutes

Levels of Communication: Intrapersonal; Interpersonal, Organizational, Mass communication

The Flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group)

UNIT III

Sure Outcomes: Emerging Technologies: Solar Energy in Spain

Grammar: Types of Sentences: Simple, Compound and Complex; Declarative, Interrogative, Imperative and Exclamatory; Writing: E-mails; Vocabulary: Commonly Confused Words

Non-verbal Communication: Kinesics; Proxemics; Paralinguistic features; Chronemics. Role of Body Language during Presentation, GD and Interview

UNIT IV

Sure Outcomes: Water: The Elixir of Life

Grammar: Subject-Verb Agreement; Writing: Official Reports, Technical Reports; Vocabulary: English Spelling, Commonly misspelt words

Barriers to Communication: Definition of Noise; Classification of Barriers; overcoming barriers

Listening: Types of Listening; Traits of a Good Listener; Active vs. Passive Listening; Empathetic Listening

UNIT V

Sure Outcomes: The Secret of Work

Grammar: Active and Passive Voice; Writing: Note-making; Vocabulary: Connotations

The Models of Communication: Linear; Interactive; Transactional; Johari Window; Transactional Analysis

Communicative Styles: Assertive, Aggressive, Passive-aggressive, Submissive, Manipulative

Prescribed Textbooks:

1. *Sure Outcomes* published by Orient Black Swan (with CD)
2. *Technical Communication*, Principles and Practices, Meenakshi Raman and Sangeeta Sharma, 3rd Edition, Oxford University Press, 2015

The books prescribed serve as students' handbooks. The reader comprises essays which are particularly relevant to the needs of engineering students. The teacher should focus on developing LSRW skills of students while using the prescribed text and exercises. The classes should be interactive. The students should be encouraged to participate in the classroom proceedings and to write short paragraphs and essays. The main aim is to encourage two-way communication in place of one-sided lecture.

References:

1. Developing Communication Skills, 2/e. by Krishna Mohan &MeeraBanerji , Macmillan, 2009
2. Essential Grammar in Use, (with CD), Raymond Murphy, 3/e, Cambridge University Press, 2009
3. English Grammar and Composition, David Grene, McMillan India Ltd.
4. Everyday Dialogues in English by Robert J. Dixson, Prentice-Hall of India Ltd., 2006.
5. Basic Communication Skills for Technology, Andrea J Ruthurford, Pearson Education, Asia.
6. English for Technical Communication, AyshaViswamohan, Tata Mc-Graw Hill

7. Communication Skills for Technical Students, Farhathullah, T.M., Orient Blackswan, 2008
8. English for Technical Communication, Vol. 1 & 2, by K. R. Lakshmi Narayanan, Sci tech. Publications.

Course Outcomes:

1. Students will increase their vocabulary through the study of word parts, use of context clues, idiomatic expressions, and practice with a dictionary
2. Students exhibit effective writing skills and create effective documents in technical communication such as letters, reports and emails
3. Students will understand the factors that influence the use of grammar and vocabulary in speech and writing
4. Students shall develop professional communication skills, which are necessary for effective collaboration and cooperation with other students
5. Student will learn to effectively utilize his body language to communicate in his academic and professional career

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), If there is no correlation, put "-"

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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I Year B. Tech. I Semester

(7GC13) ENGINEERING PHYSICS
(Common to EEE and ECE)

Course Objectives:

- The mission of Engineering Physics course is to prepare students for careers in Engineering where Physics principles can be applied to the advancement of technology.
- The Engineering Physics course educates the principles of optical science and Engineering necessary to understand optical systems.
- The crystallography, X-ray diffraction of crystals and crystal defects explain how basic structure modulates properties of materials.
- The principles of Quantum mechanics and Electron theory of metals give an idea on basic development of energy in metals.
- The main objective of this course is to provide basic understanding of different Engineering materials such as semiconductors, magnetic , superconductors and nano materials.

UNIT I

PHYSICAL OPTICS, LASERS AND FIBRE OPTICS:

Physical Optics*:* Interference (review) Interference in thin films by reflection – Newton's Rings –Fraunhofer diffraction and grating-spectrum.

Lasers: Introduction - Characteristics of laser – Spontaneous and stimulated emission of Radiation– Einstein's coefficients - Population inversion – Ruby laser - He-Ne laser – Semiconductor laser - Applications of lasers.

Fiber optics: Introduction– Construction and working principle of optical fiber – Numerical aperture and acceptance angle – Types of optical fibers – Optical fiber communication system – Applications of optical fibers in sensors and medicine.

UNIT II

CRYSTALLOGRAPHY AND ULTRASONICS:

Crystallography*:* Introduction – Space lattice –Unit cell – Lattice parameters –Bravias lattice –Crystal systems – Packing fractions of SC, BCC and FCC - Directions and planes in crystals – Miller indices – Interplanar spacing in cubic crystals – X-ray diffraction - Bragg's law – Powder method of diffraction.

Ultrasonics: Introduction– Production of ultrasonics by piezoelectric method – Properties and detection – Applications in non-destructive testing.

UNIT III

QUANTUM MECHANICS AND FREE ELECTRON THEORY:

Quantum Mechanics*:* Introduction to matter waves – de'Broglie hypothesis - Heisenberg's uncertainty principle - Schrodinger's time independent wave equation – Significance of wave function - Particle in a one dimensional infinite potential well.

Free electron theory*:* Classical free electron theory –- Sources of electrical resistance – Equation for electrical conductivity - Quantum free electron theory – Fermi-Dirac distribution – Kronig - Penny model (qualitative) – Classification of solids into conductors, semiconductors and insulators.

UNIT IV

SEMICONDUCTORS ANDSUPERCONDUCTORS:

Semiconductors: Introduction – Intrinsic and extrinsic semiconductors – Drift &diffusion currents and Einstein's equation – Hall effect - Direct and indirect band gap semiconductors – Working principle of p-n junction diode, LED and photodiode.

Superconductors: Introduction –Properties of superconductors - Meissner effect – Type I and type II superconductors – Flux quantization– BCS theory(qualitative) -ac and dc Josephson effects- High T_c Superconductors - Applications of superconductors.

UNIT V

MAGNETIC MATERIALS AND NANOMATERIALS:

Magnetic materials*:* Introduction and basic definitions – Origin of magnetic moments – Bohr magneton – Classification of magnetic materials into dia, para, ferro, antiferro and ferri magnetic materials – Hysteresis - Soft and hard magnetic materials and applications.

Nanomaterials: Introduction - Significance of nano scale –Basic principles of nano materials (Surface area and quantum confinement) – Physical properties: optical, thermal, mechanical and magnetic properties –Synthesis of nano materials: ball mill, chemical vapour deposition, sol-gel methods – structure and properties of CNT -Applications of nano materials.

Text Books:

1. Engineering Physics –K. Thyagarajan, II Edition,MacGraw Hill Publishers, 2013.
2. Engineering physics –P.K.palanisamy, 2nd Edition,Scitech publisher, 2013.

Reference Books:

1. Engineering physics – S. ManiNaidu, I Edition,Pearson Education, 2012.
2. Engineering Physics – D K Pandey, S. Chaturvedi, I Edition,Cengage Learning, 2012.

3. Engineering Physics – Gaur and Gupta Dhanapati, 7th Edition,RaiPublishers , 1992.
4. Engineering Physics – M. Arumugam, II Edition, Anuradha Publications, 1997.
5. Text book of Nanoscience and Technology:B S Murthy, P.Shankar, Baldev Raj B BRath, James Murday, I Edition,University Press, 2012.
6. Engineering physics – M.N. Avadhanulu and P.G. KrshiSagar, Chand and Co, Revised Edi 2013.

Course Outcomes:

1. Students gain knowledge about basic concepts of optics, fiber optics, and lasers
2. Students will be able to identify different types of crystal structures that occur in materials and understand production and application of Ultrasonics.
3. The student exhibits knowledge of the roots and founding principles of Quantum mechanics and band theory of solids.
4. Students develop an understanding of the basic principles underlying the Semiconductor and superconductors.
5. Students become familiar with the general properties of magnetic materials and nano-materials.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

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I Year B.Tech. I Semester

(7GC14) ENGINEERING MATHEMATICS – I
(Common to all branches)

Course Objectives:

- The subject gives the knowledge about matrices and applications to solve linear equations.
- The course intends to provide an overview of Eigen values and Eigen vectors which occur in Physical and engineering problems.
- To understand the differential equations of first order with their applications.
- To provide an overview of differential equations of second and higher order with their applications
- To understand the concepts of mean value theorems and functions of several variables

UNIT I

Real Matrices: Types - definitions - Elementary transformations – Rank – Echelon form – Consistency-Solution of Linear System of Homogenous and Non Homogeneous equations.

Eigen Values & Eigen Vectors: Eigen Values, Eigen vectors – Properties, Cayley – Hamilton Theorem.

UNIT II

Diagonalization of matrix - Quadratic form: Reduction of quadratic form to canonical form - nature - Linear Transformation –Orthogonal Transformation.

Complex Matrices - Hermitian, Skew-Hermitian, Unitary matrices- Eigen Values, Eigen vectors – Properties.

UNIT III

Differential equations of first order and first degree: Linear and Bernoulli equations. Applications to Newton's law of cooling, law of natural growth and decay, orthogonal trajectories.

UNIT IV

Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax}, sin*ax*/cos*ax*, polynomials in x, $e^{ax}\sin ax / e^{ax}\cos ax / e^{ax}x^n$, *xsin ax/x cosax*, method of variation of parameters. Applications to oscillatory electrical circuits.

UNIT V

Rolle's Theorem – Lagrange's Mean Value Theorem (without proof).Functions of several variables – Partial differentiation- Chain rule-Jacobian – Maxima and Minima of functions of two variables, Lagrangian method of Multipliers with three variables only.

Prescribed Text Books:

Higher Engineering Mathematics, B.S.Grewal, 43rd Edition, Khanna publishers, 2014.

Reference Books:

1. Advanced Engineering Mathematics, EriwinKreyszig, 9th edition, Wiley International edition.
2. Engineering Mathematics, H.K.Dass and Verma Rama, S. Chand, 2007.
3. Engineering Mathematics, Pal and Bhunia, First edition, Oxford University,2015.
4. Higher Engineering Mathematics, B.V. Ramana, Tata McGraw Hill Publishing Company limited, 2006.
5. Higher Engineering Mathematics, John Bird 7th Edition, Routledge-Taylor and Francis Group London, 2014.

Course Outcomes:

1. Students will be able to apply this knowledge to solve linear equations.
2. Student will understand the concept of modeling or translating a physical or any other.
3. Students will be able to solve first order differential equations and their applications.
4. Students will learn the usage of higher order differential equations that are applied to real world problems.
5. Students will exhibit an ability to identify, formulates, and solve the problems on functions of several variables.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

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I Year B. Tech., I Semester

(7G111) PROBLEM SOLVING TECHNIQUES AND C PROGRAMMING

(Common to ALL branches)

Course Objectives:

- Introduction to computer peripherals, Software development.
- Describe when and how to use the C statement and to Write, Compile and Debug basic C programs using an IDE
- Write and debug programs using an IDE and the principles of designing
- Structured programs when and how to use the appropriate statements available in the C language
- Write basic C programs using, Selection statements, Repetitive statements, Functions, Arrays and Strings

UNIT I

Introduction to Computer Problem Solving: Introduction to Computer Systems, Computer Environments, Computer Languages, Introduction to Problem Solving Aspect, Top- down Design, Implementation of Algorithms, Flow Charts, SDLC.

UNIT II

Introduction to C Language: Structure of a C Language program, Creating and Running C programs, Keywords, Identifiers, Data Types, typedef, enumerated Types variables, constants, input/output. Operators and Expressions, precedence and associatively, Type Conversions, Bitwise Operators. Example programs for each topic.

UNIT III

C Program Statements, Selection and Decision making Statements-two way selection –if…else statements, multi way selection-switch statements. Loop Control Statements-concept of a loop, Loops in C-while loop, do…while loop, for loop, Other Related Statements -break, continue, goto. Example programs for each topic.

UNIT IV

ARRAYS: Declaring and Referencing Arrays, Array Subscripts, Using for Loops for Sequential Access, Multidimensional Arrays.

Strings: String Basics, String Library Functions, Array of Strings. Example programs for each topic.

UNIT V

Functions: Library Functions in C, User defined Functions,-declaration, definition, calling of function, types of User defined functions, Parameter passing methods-pass by value, pass by reference, Scope, Storage Classes - Auto, Register, Static, Extern, Scope rules, Type Qualifiers, Recursion - Recursive Functions, Preprocessor Commands. Using Array Elements as Function Arguments. Example programs for each topic.

Text Books:

1. C Programming and Data Structures. B. AForouzan, R. F.Gilberg, Cengage learning, Indian edition.
2. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. Ananda Rao, Pearson Education.
3. C and Data Structures, E.Balaguruswamy, Tata McGraw Hill.
4. How to Solve it By Computer, R.G.Dromey,PHI.

Reference Books:

1. C and Data Structures, A snapshot oriented treatise with live engineering examples, Dr. N.B.Venkateswarlu, Dr. E.V.Prasad, S. Chand.
2. LET US C, YeswanthKanitkar, Ninth Edition, BPB Publication.

Course Outcomes:

After completion of the course student will be able to

1. Understand the importance of the software development process and System development tools.
2. Understand general principles of C programming language and able to write simple program in C.
3. Understand the conditional and iteration statements in C language and able to write simple programs
4. Able to develop the programs based on arrays and strings.
5. Able to develop the programs based on user-defined functions and their principles.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

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B.Tech. I Year I SEM

(7G311) FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING

(**Common to EEE and ECE**)

Course Objectives:

1. To learn the basic fundamentals of circuit components, circuit laws and network theorems.
2. To understand the concepts of semiconductor diode and its applications.
3. To understand the basic concepts of Bipolar Junction transistor.

UNIT I

CIRCUIT ELEMENTS: - Sources: Voltage and Current Sources, Resistors-Types- resistance color coding-potentiometer-types, Capacitors-types-uses of capacitors, Inductors-types, Ohm's Law-R, L, C Voltage, Current, Power & Energy.

UNIT II

NETWORK THEOREMS (D.C. Excitation only):- Ohm's law, Kirchhoff laws-network reduction techniques-series, parallel, series parallel circuits-source transformations. Thevenin's Theorem- Norton's Theorem-Superposition Theorem-maximum power transfer theorem.

UNIT III

SEMICONDUCTOR DIODEs : Energy Band Diagram of Semi conductors(Intrinsic & Extrinsic), PN Diode, Drift & Diffusion currents, V-I Characteristics of PN Junction Diode (Ideal, Simplified and Piece-wise, Practical), Temperature Dependency, Transition and Diffusion Capacitances, Breakdown Mechanisms in semiconductor diodes, Zener diode characteristics & Zener diode acts as a regulator.

UNIT IV

DIODE APPLICATIONS: Half Wave and Full Wave Rectifiers – General Filter Considerations – Capacitor Filter – RC Filter, Choke Filter, LC Filter, π-Filter.

UNIT V

INTRODUCTION OF BJT: Transistor constructions – types. Transistor operation in CB, CE and CC configurations and their Characteristics, Multimeter, CRO, DSO, Function Generator.

Text Books:

1. "Electronic Devices and Circuits" David A Bell, Fifth Edition, 2008, Oxford University Press.
2. "Circuits & Network Analysis & Synthesis", Sudhakar A & Shyammohan S Palli, 4th Edition, Tata McGraw Hill, 2010.
3. Engineering basics: Electrical, Electronics and computer Engineering" , T.Thyagarajan, New Age International, 2007
4. Electronic devices and circuits by G K.Mithal.

Reference Books:

1. "Electronic Devices and Circuits" J. Millman and Halkias, 1991 edition, 2008, TMH.
2. "Electronic Devices and Circuit Theory" Robert L.Boylestad and Louis Nashelsky, 9th edition, PHI.
3. "Electronic Principles" Albert Malvino, David J Bates, MGH, SIE 2007.
4. "Micro Electronic Circuits" Sedra and Smith, Oxford University Press.

Course Outcomes:

1. Analyze the basic concept of Electrical circuits
2. Solve Electrical and Electronics circuits for voltage, current and power using Network theorems
3. Analyze the concepts of semiconductor diodes.
4. Know the application of diodes
5. Analyze the concepts of Bi-polar Junction Transistor

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

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I Year B.Tech. I Semester

(7G515) ENGINEERING & IT WORKSHOP
(Common to EEE, CSE, IT, ECE)

ENGINEERING WORKSHOP

Course Objectives:

The budding Engineer may turn out to be a technologist, scientist, entrepreneur, practitioner, consultant etc. There is a need to equip the engineer with the knowledge of common and newer engineering materials as well as shop practices to fabricate, manufacture or work with materials. Essentially he should know the labour involved, machinery or equipment necessary, time required to fabricate and also should be able to estimate the cost of the product or job work. Hence engineering work shop practice is included to introduce some common shop practices and on hand experience to appreciate the use of skill, tools, equipment and general practices to all the engineering students.

1. **TRADES FOR EXERCISES:**
   - 1.1 **Carpentry shop**– Two joints (exercises) involving tenon and mortising, groove and tongue: Making middle lap T joint, cross lap joint, mortise and tenon T joint, Bridle T joint from out of 300 x 40 x 25 mm soft wood stock
   - 1.2 **Sheet metal shop**– Two jobs (exercises) from: Tray, cylinder, hopper or funnel from out of 22 or 20 gauge G.I. sheet.
   - 1.3 **House-wiring**– Two jobs (exercises) from: wiring for ceiling rose and two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp, wiring for a water pump with single phase starter.
2. **TRADES FOR DEMONSTRATION:**
   - **a. Plumbing**
   - **b. Fitting**

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

Reference Books:

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

Course outcomes:

1. An ability to identify and apply suitable tools for manufacturing of components in workshop trades of Carpentry & Tin smithy.
2. An ability to identify and use hand tools for electrical wiring and give power supply to domestic installations.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

I.T WORKSHOP

Course Objectives:

- To provide Technical training to the students on Productivity tools like Word processors, Spreadsheets, Presentations
- To make the students know about the internal parts of a computer, assembling a computer from the parts, preparing a computer by installing the operating system
- To learn about Networking of computers and use Internet facility for Browsing and Searching.

Preparing your Computer

Task 1: Learn about Computer: Identify the internal parts of a computer, and its peripherals. Represent the same in the form of diagrams including Block diagram of a computer. Write specifications for each part of a computer including peripherals and specification of Desktop computer. Submit it in the form of a report.

Task 2: Assembling a Computer: Disassemble and assemble the PC back to working condition. Students should be able to trouble shoot the computer and identify working and non-working parts. Student should identify the problem correctly by various methods available (eg: beeps). Students should record the process of assembling and trouble shooting a computer.

Task 3: Install Operating system: Student should install Linux on the computer. Student may install another operating system (including proprietary software) and make the system dual boot or multi boot. Students should record the entire installation process.

Task 4: Operating system features: Students should record the various features that are supported by the operating system(s) installed. They have to submit a report on it. Students should be able to access CD/DVD drives, write CD/DVDs, access pen drives, print files, etc. Students should install new application software and record the installation process.

Networking and Internet

Task 5: Networking: Students should connect two computers directly using a cable or wireless connectivity and share information. Students should connect two or more computers using switch/hub and share information. Crimpling activity, logical configuration etc should be done by the student. The entire process has to be documented.

Task 6: Browsing Internet: Student should access the Internet for Browsing. Students should search the Internet for required information. Students should be able to create e-mail account and send email. They should get acquaintance with applications like Facebook, Skype etc. If Intranet mailing facility is available in the organization, then students should share the information using it. If the operating system supports sending messages to multiple users (LINUX supports it) in the same network, then it should be done by the student. Students are expected to submit the information about different browsers available, their features, search process using different natural languages, and creating e-mail account.

Task 7: Antivirus: Students should download freely available Antivirus software, install it and use it to check for threats to the computer being used. Students should submit information about the features of the antivirus used, installation process, about virus definitions, virus engine etc.

Productivity tools

Task 8: Word Processor: Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, Inserting header and Footer, changing the font, changing the colour, including images and tables in the word file, making page setup, copy and paste block of text, images, tables, linking the images which are present in other directory, formatting paragraphs, spell checking, etc.

Students should be able to prepare project cover pages, content sheet and chapter pages at the end of the task using the features studied. Students should submit a user manual of the word processor considered.

Task 9: Spreadsheet: Students should be able to create, open, save the application documents and format them as per the requirement. Some of the tasks that may be practiced are Managing the worksheet environment, creating cell data, inserting and deleting cell data, format cells, adjust the cell size, applying formulas and functions, preparing charts, sorting cells. Students should submit a user manual of the Spreadsheet application considered.

Task 10: Presentations: creating, opening, saving and running the presentations, selecting the style for slides, formatting the slides with different fonts, colours, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyper linking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.

Optional Tasks:

Task 11: Laboratory Equipment: Students may submit a report on specifications of various equipment that may be used by them for the laboratories in their curriculum starting from I B.Tech to IV. B.Tech. It can vary from department to department. Students can refer to their syllabus books, consult staff members of the concerned department or refer websites. The following is a sample list. Instructors may make modifications to the list to suit the department concerned.

- Desktop computer
- Server computer
- Switch (computer science related)
- Microprocessor kit
- Micro controller kit
- Lathe machine
- Generators
- Construction material
- Air conditioner
- UPS and Inverter
- RO system
- Electrical Rectifier
- CRO
- Function Generator
- Microwave benches

Task 12: Software: Students may submit a report on specifications of various software that may be used by them for the laboratories in their curriculum starting from I B. Tech., to IV. B.Tech., The software may be proprietary software or Free and Open source software. It can vary from department to department. Students can refer to their syllabus books, consult staff members of the concerned department or refer websites. The following is a sample list. Instructors may make modifications to the list to suit the department concerned.

- Desktop operating system
- Server operating system
- Antivirus software
- MATLAB
- CAD/CAM software
- AUTOCAD

Reference Books:

1. Introduction to Computers, Peter Norton, Mc Graw Hill
2. MOS study guide for word, Excel, Power point & Outlook Exams", Joan Lambert, Joyce Cox, PHI.
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. Networking your computers and devices, Rusen, PHI
5. Trouble shooting, Maintaining & Repairing PCs", Bige lows, TMH

Course Outcome:

1. Disassemble and Assemble a Personal Computer and prepare the computer ready to use.
2. Prepare the Documents using Word processors
3. Prepare Slide presentations using the presentation tool
4. Interconnect two or more computers for information sharing
5. Access the Internet and Browse it to obtain the required information
6. Install single or dual operating systems on computer

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

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I Year B. Tech., I Semester

(7G112) PROGRAMMING IN C LAB
((Common to EEE, ECE)

Course Objectives:

- To make the student learn a programming language.
- To teach the student to write programs in C to solve the problems.
- To introduce the student to simple linear data structures such as lists, stacks, queues.

Recommended Systems/Software Requirements:

Intel based desktop PC with ANSI C/ TURBO C Compiler and Supporting Editors

Exercise l:

Minimum of 4 programs on Data types, Variables, Constants and Input and Output.

Exercise 2:

Minimum of 4 programs on each Operator, Expressions and Type Conversions.

Exercise 3:

Minimum of 4 programs on Conditional Statements [two way and multipath].

Exercise 4:

Minimum of 4 programs on each Loop Control Statements [for, while and do-While]

Exercise 5:

Minimum of 4 programs on Unconditioned JUMP Statements- break, continue, Goto.

Exercise 6:

Minimum of 4 programs on Declaring Arrays, Referencing Arrays, Array Subscripts. Using for loop for sequential Access.

Exercise 7:

Minimum of 4 programs on Multidimensional Arrays.

Exercise 8:

Minimum of 4 programs on String Basics, String Library Functions and Array of Strings.

Exercise 9:

Minimum of 4 programs on simple user defined functions, Parameter passing methods- pass by value, pass by reference.

Exercise 10:

Minimum of 4 programs on Storage classes- Auto, Register, Static and Extern

Exercise 11:

Minimum of 4 programs on Recursive Functions, Preprocessor commands.

Exercise 12:

Minimum of 4 programs on using Array Elements as Function Arguments.

Course outcomes:

1. Know concepts in problem solving.
2. To do programming in C language
3. To write diversified solutions using C language

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

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I Year B. Tech. I Semester

(7GC16) ENGINEERING PHYSICSLAB

(Common to EEE and ECE)

COURSE OBJECTIVES:

- The student will able to handle and understanding of different apparatus to perform experiments.
- The student will learn practical measurement of different physical quantities.
- The student will able to characterize the materials and their properties.
- The student allows learning practical experience of theory conceptual values.

LIST OF EXPERIMENTS

Any 10 of the following experiments have to be performed

1. Determination of wavelengths of various colors of mercury spectrum using diffraction grating in normal incidence method
2. Determination of dispersive power of the prism
3. Determination of thickness of thin object by wedge method
4. Determination of radius of curvature of lens by Newton's Rings
5. Laser : Diffraction due to single slit
6. Laser : Diffraction due to double slit
7. Laser: Determination of wavelength using diffraction grating
8. Determination of Numerical aperture of an optical fiber
9. Meldi's experiment: Determination of the frequency of tuning fork
10. Determination of particle size by using laser.
11. Energy gap of a material using p-n junction diode
12. Hall effect : Determination of mobility of charge carriers in semiconductor
13. B-H curve : Hysteresis loss.
14. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
15. Determination of rigidity modulus –Torsional pendulum

Manual cum Record:

Prepared by Engineering Physics Faculty Members of Annamacharya Institute of Technology and Sciences.

Reference Books:

1. Engineering Physics Practicals – Dr. B. Srinivasa Rao V.K.V. Krishna K.S Rudramamba
2. Engineering Practical Physics – S.L Kakani & Shubra Kakani

C**ourse Outcomes:**

1. Students will understand the characteristics and behavior of various materials
2. Students will be able to understand the applications of optics using basic fundamentals of physics
3. Students will exhibit an ability to use techniques and skills associated with modern engineering tools such as lasers and fiber optics
4. Students will be able to measure properties of a semiconductor and magnetic materials

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), If there is no correlation, put "-"

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I Year B.Tech. I Semester

(7G312) FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING LAB

(Common to EEE & ECE)

Course Objectives:

- To determine the characteristics of semiconductor diode.
- To perform various rectifier circuits in practical approach.
- To perform input and output characteristics of BJT for various configurations.

Perform the following Experiments

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCBs, Diodes, BJTs.
2. Study and operation of
   - Multi-meters (Analog and Digital)
   - Function Generator
   - Regulated Power Supplies
   - CRO
3. Verification of Kirchhoff's Voltage and Current Law
4. Forward and Reverse Bias Characteristics of PN junction Diode.
5. V-I Characteristics of Zener Diode
6. Half Wave Rectifier with and without filter.
7. Full Wave (Center trapped) Rectifier with and without filter.
8. Full Wave (Bridge) Rectifier with and without filter.
9. Zener Diode as a Voltage Regulator
10. Input and Output Characteristics of Transistor CB Characteristics.
11. Input and Output Characteristics of Transistor CE Characteristics.
12. Input and Output Characteristics of Transistor CC Characteristics.

Course Outcomes:

1. 1. Able to determine the parameters like cut-in voltage, resistances and breakdown voltage of Semiconductor diode
2. Able to design DC power supply circuits using rectifiers and filters
3. Able to choose the desired configuration for specified applications

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

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I Year B. Tech. II Semester

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I Year B. Tech., II Semester

(7G121) DATA STRUCTURES
(Common to ALL branches)

Course Objectives:

- Structured programs 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 and Strings
- Implementation of C applications for data structures, sorting and searching.

UNIT I

Pointers - Introduction, Features of Pointers, Pointer Declaration and Definition, Void Pointers, pointers for inter function communication, Pointers to Pointers, Pointer Applications: arrays and pointers, pointer arithmetic, Dynamic Memory Allocation, Pointers to Functions, pointer to void and command line arguments.

UNIT II

Structures – Definition, initialization, accessing structures, nested structures, array of structures, structures and functions. Pointers and Structures. Unions. Sample programs

Files: Introduction to Streams and Files, Standard library input / output functions, formatted input / output functions, character input/output functions; Text verses binary Streams, Standard library functions for files. File examples.

Searching and Sorting - Exchange (Bubble) Sort, Selection Sort, Quick Sort, Insertion Sort, Merge Sort, Searching- Linear and Binary Search Methods.

UNIT III

Data Structures: Overview of Data Structure. **Stack:** Representation of a Stack, Operation on a Stack, Implementation of a Stack using Arrays and Pointers, Representation of Arithmetic Expressions, Infix, Prefix, and Postfix Notations, Evaluation of Postfix Expression, Recursion.

Queues: Representation of Queue, Insertion, Deletion, Searching Operations, Circular Queues.

UNIT IV

Linked List: Singly Linked List, Linked List with and without header, Insertion, Deletion and Searching Operations.

Doubly Linked List: Insertion, Deletion and Searching Operations.

Circular Linked List: Insertion, Deletion and Searching Operations.

UNIT V

Trees: Introduction to Trees, Binary Trees, creation of binary tree, Operations on Binary Tree. Introduction to Binary Search Tree, Operations on Binary Search Trees.

Graphs: Defining graph, basic terminology, graph representation.

Text Books:

1. C Programming and Data Structures.B.A Forouzan,R. F.Gilberg,Cengage learning, Indian edition.
2. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. Ananda Rao, Pearson Education.
3. Data Structures and Algorithms: Concepts, Techniques and ApplicationsG.A.V. Pai[UNIT-V]

Reference Books:

1. C and Data Structures, A snapshot oriented treatise with live engineering examples, Dr. N.B.Venkateswarlu, Dr. E.V.Prasad, S. Chand.
2. LET US C, Yeswanth Kanitkar, Ninth Edition, BPB Publication.

Course Outcomes:

1. Understand the purpose of pointers for parameter passing, referencing and dereferencing.
2. Understands the concepts of structures, unions, File management and how to solve the applications like searching and sorting using C programming language.
3. Understand what and how to design data structure programs of stacks and queues using C programming language.
4. Understand what and how to design data structure programs of different types of linked list.
5. Understand how to design the non-linear data structures of trees and graphs.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

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I Year B. Tech. II Semester

(7GC22) ENGINEERING CHEMISTRY
(Common to ECE and EEE)

Course Objectives:

- The course main aim is to impart in-depth knowledge of the subject and highlight the role of chemistry in the field of engineering.
- The course is framed to strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial/engineering applications.
- The lucid explanation of the topics will help students understand the fundamental concepts and apply them to design engineering materials and solve problems related to them. An attempt has been made to logically correlate the topic with its application.
- The extension of fundamentals of electrochemistry to energy storage devices such as commercial batteries and fuel cells.
- The student will understand the concepts of chemistry in respect of Electrochemical cells, fuel cells, mechanism of corrosion and factors to influence, polymers with their applications, analytical methods, engineering materials and water chemistry

UNIT I

WATER TREATMENT: Impurities in water, Hardness of water and its units, Disadvantages of hard water, Estimation of hardness by EDTA method, Numerical problems on hardness, Estimation of dissolved oxygen and alkalinity in water. Water treatment for domestic purpose. Disinfection - Definition, Kinds of disinfectants (Bleaching powder & Ozone) Break point chlorination.

Industrial Use of water, Boiler troubles-Priming and foaming, Scale & Sludge, Caustic Embrittlement and Boiler Corrosion.

Treatment of Boiler Feed water: Internal Treatment- Colloidal, Phosphate, Carbonate, Calgon and sodium aluminate conditioning. External Treatment- Zeolite Process, Ion-Exchange process, Desalination of brackish water by Reverse Osmosis

UNIT II

ELECTROCHEMISTRY: Basic concepts-Nernst equation, Galvanic cell, Standard Reduction Potential (SRP), numerical calculations on EMF. Batteries: types of batteries, primary batteries-Dry cell, Secondary batteries-Ni-Cd, Lithium Ion Batteries. Fuels cells-Hydrogen-Oxygen fuel cell & Methanol-Oxygen fuel cell.

Conductometry-basic concepts, conductance, molar and equivalent conductance, measurement of conductance, Types of conductometric titrations-strong acid Vs. strong base, weak acid Vs. strong base, strong acid Vs. weak base and weak acid Vs. weak base.

CORROSION: Definition & Types - dry & wet Corrosions, Electrochemical theory of corrosion, concentration cell corrosion, galvanic corrosion, factors affecting the corrosion, Prevention: Anodic and Cathodic protection, Electroplating -Nickel, copper & Electroless plating-Nickel.

UNIT III

POLYMERS: Introduction to polymers, Types of Polymerization: Addition, Condensation & Co-polymerization (without mechanism). Plastics-Thermoplastics and Thermosetting Plastics: Preparation, properties and applications of Bakelite, Nylon-6,6, PVC and PE.

Natural Rubber: Processing of natural rubber, vulcanization and compounding of rubber. Elastomers: Preparation, properties and Engineering applications of Buna-S, Buna-N and polyurethane rubbers.

Conducting polymers: Synthesis, mechanism & applications of Polyacetylene

Inorganic Polymers: Introduction, Silicones, Polyphosphazenes and poly dispersive Index

UNIT IV

FUEL TECHNOLOGY: Classification of Fuels, Calorific Value – Units, its determination using Bomb calorimeter, Numerical Problems on calorific value and Combustion Solid Fuels - Coke: Manufacture of Coke by Otto Hoffmann's by product oven.

Liquid Fuels: Petroleum: Refining of Petroleum, Synthetic Petrol: Bergius Processes, Fischer Tropsch's synthesis. Gasoline: Knocking, Octane Number. Diesel - Cetane number.

Gaseous Fuels: Origin, Production and uses of Natural gas, Water Gas and Biogas. Flue Gas analysis by Orsat's apparatus

UNIT V

CHEMISTRY OF ENGINEERING MATERIALS: Cement: Composition & manufacture of Portland cement, Setting and Hardening (Hydration and Hydrolysis) Refractories: Definition, classification with suitable examples, properties - Refractoriness, RUL, Dimensional Stability, Porosity and Thermal spalling and Applications of refractory materials

Lubricants: Definition, classification, mechanism of lubrication and properties of lubricants - Viscosity, viscosity index, flash and fire point, cloud and pour point, mechanical strength, neutralizing number and Aniline point, applications of lubricants.

Text Books:

1. 1. Engineering Chemistry by K.N Jayaveera, G.V Subba Reddy and C. Ramachandraiah, McGraw Hill Higher Education, New Delhi, 1st edition, 2013.
2. A Text Book of Engineering Chemistry, Jain and Jain, Dhanapath Rai Publishing Company, New Delhi, 17th Edition, 2013

Reference Books:

1. A Text book of Engineering Chemistry by S.S Dhara, S.S Umare, S.Chand Publications, New Delhi, 14th Edition, 2014.
2. Engineering Chemistry by K.B Chandra Sekhar, UN. Das and Sujatha Mishra, SCITECH, Publications India Pvt. Limited, Chennai, 2nd Edition, 2012.
3. Concepts of Engineering Chemistry- Ashima Srivastava and N.N. Jahnavi, Acme Learning Pvt Ltd, First Edition, 2013.
4. Text Book of Engineering Chemistry, Shashichawla, DhanapathRai & Co Publications, New Delhi, 4th Edition, 2014.
5. Engineering Chemistry, K. Sesha Maheswaramma and Mrudula Chugh, Pearson Education, First Edition, 2013

Course Outcomes:

1. The students will be able to understand the basic concepts of water analysis methods which help them in solving problems related to water treatment methods.
2. The students will be able to understand the basic principles of conductometry, batteries & fuel cells, and extends the knowledge to solve problems of corrosion.
3. The students will be able to synthesize and differentiate different types of polymers.
4. The students will be able to derive or manufacture different types of fuels and elucidate their properties
5. The students will be able to manufacture cement, understand the basic concepts of refractories, lubricants and elucidate their properties

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), If there is no correlation, put "-"

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I Year B. Tech. II Semester

(7G523) GEOMETRICAL DRAWING
(Common to EEE, ECE)

Course Objectives:

- To enable the students with various concepts like Dimensioning, Conventions and standards related to working drawing in order to become professionally efficient.
- To introduce fundamental concepts of curves used in engineering,
- To impart and inculcate proper understanding of the theory of projections, projection of points, lines, planes and solids.
- To improve the visualization skills of the student.
- To prepare the student for future engineering positions.

UNIT I

INTRODUCTION: Lettering –Geometrical constructions - Construction of polygons by General method

CONICS: Ellipse, Parabola and Hyperbola (General method only).

Special Methods: Ellipse - Concentric Circles method, Oblong method & Arcs of Circles method - Drawing tangent& normal to the conics.

CYCLOIDAL CURVES: Cycloid, Epi-cycloid, Hypo-cycloid (simple problems) - Drawing tangent & normal to the cycloidal curves.

UNIT II

PROJECTIONS OF POINTS & LINES: Projections of points - Projections of lines inclined to one reference plane, Projections of lines inclined to both reference planes.

UNIT III

PROJECTIONS OF PLANES: Projection of planes inclined to one reference plane - and inclined to both the reference planes.

UNIT IV

PROJECTIONS OF SOLIDS: Cylinder, Cone, Prism and Pyramid - Axis Inclined to one reference plane, Axis inclined to both the reference planes.

UNIT V

ISOMETRIC PROJECTIONS: Projections of Lines, Planes and Simple Solids – Prism, Pyramid, Cylinder and Cone in simple positions only.

CONVERSION OF VIEWS: Conversions of Orthographic views into Isometric views and Conversion of Isometric views to Orthographic views.

Text books:

1. Engineering Drawing by N.D.Bhatt

Reference Books:

1. Engineering Graphics by K.L. Narayana & P. Kannayya
2. Engineering Drawing and graphics by Venugopal/ New age
3. Engineering Drawing by Johle / TMI

Course Outcomes:

1. Students will be able to know and understand the conventions and the methods of Geometrical Drawing with proper dimensions and annotations for two-dimensional engineering drawings.
2. Able to understand the application of industry standards and techniques applied in Geometrical Drawing.
3. Comprehend general projection theory, with an emphasis on the use of orthographic projection to represent three-dimensional objects in two-dimensional views.
4. Can employ 3D pictorial sketching to aid in the visualization process and to efficiently communicate ideas graphically.
5. Students will be able to improve their visualization skills, analyze a drawing and bring out any inconsistencies to put forth inferences graphically.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), if there is no correlation, put "-"

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I Year B. Tech. II Semester

(7GC24) ENGINEERING MATHEMATICS – II

(Common to all branches)

Course Objectives:

- To apply this knowledge to evaluate the Multiple Integrals in real life situations.
- To introduce the concepts of Laplace transforms.
- To apply the knowledge of Inverse Laplace transforms for engineering problems.
- To provide the concepts of vector differentiation and integration.
- To apply the knowledge of Green's theorem, Stroke's theorem and Gauss divergence theorem.

UNIT I

Curve Tracing – Cartesian and Polar curves

Multiple integrals: Double integral – Evaluation - Change of Variables - Change of order of integration- Triple integral - Evaluation.

UNIT II

Laplace transforms of standard functions– First shifting Theorem, Change of scale property, Multiplication by t^n, division by t, Transforms of derivatives and integrals – Second shifting theorem– Laplace transform of Periodic functions.

UNIT III

Inverse Laplace transforms – Convolution theorem. Application of Laplace transforms to ordinary differential equations of first and second order.

UNIT IV

Vector Calculus: Scalar and vector point functions, Gradient, Divergence, Curl, Properties, Del applied twice to point functions, Line integral - Area, Surface and volume integrals.

UNIT V

Vector integral theorems: Green's theorem – Stroke's theorem - Gauss's Divergence Theorem (without proofs) and their applications.

Text Book:

Higher Engineering Mathematics, B.S.Grewal, Khanna publishers-43rdEdition (2014)

Reference Books:

1. Advanced Engineering Mathematics, EriwinKreyszig, 9 th edition, Wiley International edition.
2. Engineering Mathematics, H.K.Dass and Verma Rama, S. Chand, 2007.
3. Engineering Mathematics, Pal and Bhunia, First edition, Oxford University, 2015.
4. Higher Engineering Mathematics, B.V. Ramana, Tata McGraw Hill Publishing Company Limited, 2006.
5. Higher Engineering Mathematics, John Bird 7th Edition, Routledge-Taylor and Francis Group London, 2014.

Course Outcomes:

1. Student will understand the applications of Curve tracing and multiple integration
2. Student will exhibit the Knowledge of Laplace transforms.
3. Student will exhibit the Knowledge of Inverse Laplace transforms and solve the ordinary differential equations with given initial boundary conditions in engineering subjects
4. Student will be able to analyze the Vector differentiation and Integration in various domains.
5. Student understands the applications of Vector Integral theorems.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), if there is no correlation, put "-"

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I Year B. Tech. II Semester

(7G321) ELECTRONIC DEVICES AND CIRCUITS
(Common to EEE & ECE)

Course Objectives:

- To understand the concepts of biasing and stabilization in BJT.
- To understand the concepts of FET, MOSFET and their biasing techniques.
- To analyze the parameters like band width, gain and impedances for single and multistage amplifier circuits.
- To understand the working principles of special purpose electronic devices.

UNIT I

BIASING & STABILITY: Overview of BJT Configurations, Transistor Amplifying Action – Load Line Analysis of AC & DC – Operating Point. Types of Biasing: Fixed Bias – Emitter Bias – Emitter Feedback Bias - Collector to Base bias – Voltage Divider Bias. Bias Stability: Need for Stabilization – Stabilization Factors (s,S',S'') – Stability Factors for Voltage Divider Bias - Thermal Stability and Thermal Runaway – Heat Sinks**.**

UNIT II

FIELD EFFECT TRANSISTORS & ITS BIASING: - Construction of JFETs – Transfer Characteristics – FET Biasing: Fixed Bias Configuration – Self Bias Configuration – Voltage Divider Biasing – Construction and Characteristics of MOSFETs – Depletion type MOSFETs – Enhancement type MOSFETs – Biasing in MOSFETs.

UNIT III

SINGLE STAGE AMPLIFIERS: Single Stage Transistor Amplifier-How Transistor Amplifies- Graphical Demonstration of Transistor Amplifier-Practical Circuit of Transistor Amplifier-Phase Reversal- D.C. and A.C. Equivalent Circuits- Load line Analysis- A.C. emitter resistance-Formula for A.C. emitter resistance-Voltage gain in terms of A.C. emitter Resistance-Voltage gain-Classification of Amplifiers-Amplifier equivalent circuit-Equivalent circuit with signal source-Input impedance of and amplifier.

UNIT IV

FET AMPLIFIERS: Small signal model of JFET and MOSFET – Common source and common Drain amplifiers using FET**.**

Unit-V

SPECIAL PURPOSE ELECTRONIC DEVICES: Varactor Diode, Tunnel Diode, LED, PIN Diode, Schottky Diode, SCR, UJT, Photodiode, Phototransistor.

Text Books:

1. "Electronic Devices and Circuits" David A Bell, Fifth Edition, 2008, Oxford University Press.
2. "Electronic Devices and Circuits" J. Millman and Halkias, 1991 edition, 2008, TMH.

Reference Books:

1. "Electronic Devices and Circuit Theory" Robert L.Boylestad and Louis Nashelsky, 9th edition, PHI.
2. "Principles of Electronics", V.K.Mehta, S.Chand Publications 2004
3. "Integrated Electronics, Analog and Digital Circuits and Systems" J. Millman and Halkias, TMH.
4. "Micro Electronic Circuits" Sedra and Smith, Oxford University Press.

Course Outcomes:

1. Able to understand Biasing and Stabilization conditions of BJT.
2. Able to understand Biasing and Stabilization conditions of FET.
3. Able to design the amplifiers circuits under given requirements.
4. Able to understand the Small signal model of FET.
5. Able to have the knowledge and usage of special purpose electronic devices in various applications.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), if there is no correlation, put "-"

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I Year B. Tech., II Semester

(7G124) PROGRAMMING IN DATA STRUCTURES LAB
(Common to CIVIL, EEE, ECE and ME)

Course Objectives:

- To make the student learn a programming language.
- To teach the student to write programs in C to solve the problems.
- To introduce the student to simple linear data structures such as lists, stacks, queues.

Recommended Systems/Software Requirements:

Intel based desktop PC with ANSI C/ TURBO C Compiler and Supporting Editors

Exercise 1 : Minimum of 3 Programs on pointer basics.

Exercise 2 : Minimum of 3 Programs on Pointers applications.

Exercise 3 : Minimum of 3 programs on structures and unions

Exercise 4 : Minimum of 3 programs on basic File operations.

Exercise 5 : Minimum of 3 programs on searching and sorting techniques.

Exercise 6 : Implementation of Stack and perform all Stack operations using
i) Arrays ii) Pointers

Exercise 7 : Implementation of Queue and perform all Queue operations using
i) Arrays ii) Pointers

Exercise 8 : Implement Circular Queue (its operations) using
i) Arrays ii) Pointers

Exercise 9 : Implementation of Single Linked List and its operations using
i) Arrays ii) Pointers

Exercise 10 : Implementation of Double Linked List and its operations using
i) Arrays ii) Pointers

Exercise 11 : Implementation of Circular Linked List and its operations using
i) Arrays ii) Pointers

Exercise 12 : C program that uses Stack operations to perform the following:
i) Converting infix expression into postfix expression
ii) Evaluating the postfix expression

Exercise 13 : Implement Binary Tree using Double Linked List and its operations.

Course Outcomes:

1. Student will be able to choose appropriate data structure as applied to specified problem definition.
2. Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
3. Students will be able to use linear and non-linear data structures like stacks, queues, linked list etc.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), if there is no correlation, put "-"

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I Year B. Tech. II Semester

(7G322) ELECTRONIC DEVICES AND CIRCUITS LAB
(Common to ECE & EEE)

Course Objectives:

- To determine characteristics of JFET, MOSFET, SCR and UJT.
- To determine parameters like gain, impedances and band width of BJT and FET amplifier circuits.

Perform the following Experiments

1. Identification, Specifications and Testing of Active Devices, Low power JFETs, MOSFETs, Photodiode, Phototransistor, LEDs, SCR and UJT.
2. JFET Characteristics.
3. MOSFET Characteristics
4. Frequency response of CE Amplifier.
5. Frequency response of CB Amplifier.
6. Frequency response of CC Amplifier.
7. Frequency response of Common Source FET Amplifier.
8. V-I Characteristics of LED.
9. SCR Characteristics.
10. UJT Characteristics.
11. Photodiode and Phototransistor Characteristics
12. Soldering Practice

Course Outcomes:

Upon completion of the course students will be

1. Able to gain the knowledge and practical usage of JFET, MOSFET and some special electronic devices.

2. Able to design the amplifier circuits under given requirements.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), if there is no correlation, put "-"

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I Year B. Tech. II Semester

(7GC27) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB
(Common to all branches)

Course Objectives:

- To expose the students to a varied blend of self-instructional, learner-friendly modes of language learning
- To train students to use language effectively in everyday conversations
- To enable the students understand rudiments of public speaking skills and acquire presentation skills
- To equip the students with better pronunciation through emphasis on individual speech sounds, accent and intonation

SYLLABUS:

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

1. **Introduction to the Sounds of English- Vowels, Diphthongs & Consonants**
2. **Introduction to Stress and Intonation**
3. **Situational Dialogues**
4. **Telephone Skills**
5. **Describing Objects / Situation / People**
6. **Oral Presentations**
7. **Information Transfer**

Manual cum Record, prepared by the Faculty Members of English of the college will be used by Students.

Minimum Requirement:

The English Language Lab shall have two parts:

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

Suggested Software:

Sky Pronunciation Suite

Clarity Pronunciation Power – Part I

Learning to Speak English - 4 CDs

Course Outcomes:

1. 1. Students will learn about the significance of pronunciation, accent and intonation and will attempt to neutralize their accent
2. Students will be able to express themselves in social and professional contexts fluently
3. Students will be able to converse over phone confidently and clearly in English
4. The student will be able to describe people, objects and situations using adjectives
5. Students will enhance their public speaking skills and make technical presentations confidently
6. Students will analyze and interpret data from graphs/pie charts

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), if there is no correlation, put "-"

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
(AN AUTONOMOUS INSTITUTION)

I Year B. Tech. II Semester

(7GC25) ENGINEERING CHEMISTRY LAB
(Common to ECE and EEE)

Course Objectives:

- The student will learn practical understanding of the redox reaction.
- The student will learn the preparation and properties of synthetic polymers and other material that would provide sufficient impetus to engineer these to suit diverse applications.
- The student will also learn the hygiene aspects of water would be in a position to design methods to produce potable water using modern technology.

LIST OF EXPERIMENTS

Any 10 of the following experiments has to be performed

VOLUMETRIC ANALYSIS

Redox Titrations

1. Estimation of iron (II) using Diphenylamine indicator (Dichrometry–Internal indicator method)

Water analysis

2. Determination of total hardness of water by EDTA method
3. Estimation of calcium hardness using Murexide indicator
4. Estimation of Dissolved Oxygen by Winkler's method
5. Determination of Alkalinity of Water.

Iodometry

6. Determination of Copper by Iodometry
7.

INSTRUMENTATION

Colorimetry

8. Estimation of Iron in Cement by Colorimetry.

Conductometry

9. Conductometric titration of mixture of acids Vs strong base (Neutralization titration)
10. Determination of pH of various water samples.

Fuel analysis

11. Determination of Calorific Value of fuel by using Bomb Calorimeter

Lubricants

12. Determination of Viscosity of oils using Redwood Viscometer I
13. Determination of Viscosity of oils using Redwood Viscometer II
14. Determination of Flash and fire points of Lubricants

PREPARATION OF POLYMERS

15. Preparation of Bakelite
16. Preparation of Thiokol rubber

Manual cum Record: Prepared by the Faculty Members of Engineering Chemistry of the college will be used by Students.

Reference Books:

1. Vogel's Text book of Quantitative Chemical Analysis, J. Mendham et al, Pearson Education, Sixth Edition, 2012.
2. Chemistry Practical – Lab Manual by K.B.Chandra Sekhar, G.V.Subba Reddy and K.N.Jayaveera, SM Publications, Hyderabad, 3rd Edition, 2012.

Course Outcomes:

1. Students will understand the concept of redox systems
2. Students will exhibit skills to handle the analytical methods with confidence
3. Students will be able to acquire the operating principles and the reaction mechanisms of the instruments
4. Students will be able apply his knowledge on the basic principles of batteries

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

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

Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), if there is no correlation, put "-"

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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I Year B. Tech. II Semester

GENDERSENSITIZATION

(Audit Course)

Course Objectives:

- To develop students' sensibility with regard to issues of gender in contemporary India.
- To provide acritical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

UNIT I

UNDERSTANDING GENDER:

Gender: Why should we study it? (Towards a world of Equals: Unit-1). Socialization: Making Women, Making Men (Towards a world of Equals: Unit-2). Introduction, Preparing for Womanhood, Growing up Male, First lessons in Caste, Different Masculinities. Just relationships: Being together as Equals (Towards a World of Equals: Unit-12). Mary Komand other. Love and Acid just do not mix, Love Letters, Mothers and Fathers,

UNIT II

GENDER ANDBIOLOGY:

Missing Women: Sex Selection and its consequences (Towards a world of Equals: Unit-4) Declining Sex Ratio, Demographic Consequences. Gender Spectrum: Beyond the Binary (Towards a World of Equals: Unit-10) Two or Many? Struggles with Discrimination. Additional Reading: Our Bodies, Our Health (Towards a World of Equals: Unit-13)

UNIT III

GENDER ANDLABOUR:

Housework: The Invisible Labour (Towards a World of Equals: Unit-3) "My Mother doesn't Work". "Share the Load". Women's Work: Its Politics and Economics (Towards a World ofEquals:Unit-7). Fact and Fiction, Unrecognized and Un accounted work

UNIT IV

ISSUES OF VIOLENCE: Sexual Harassment: Say No!(Towards a World of Equals: Unit-6) Sexual Harassment, not Eve-teasing-Coping with Every day Harassment. Domestic Violence: Speaking Out (Towards a World of Equals: Unit-8) Is Home a Safe Place?-When Women Unite [Film], Rebuilding Lives Thinking about Sexual Violence (Towards a World of Equals: Unit-11)

Blaming the Victim-"I fought formy Life….."

UNIT V

GENDER STUDIES:

Knowledge: Through the Lens of Gender (Towards a World of Equals-Unit-5). Point of View. Gender and the Structure of Knowledge. whose History? Questions for Historians and Others (Towards a World Equals:Unit-9) Reclaiming a Past. Writing other Histories.

Prescribed Text Book:

"Towards a world of equals: A Bilingual Textbook on gender", A. Suneeta, Uma Bhrugubanda, DuggiralaVasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and SuiseTharu.

Note: Since it is interdisciplinary Course, Resource Person can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field.

Reference Books:

1. Sen, Amartya. "More than one Million Women are Missing." New York Review of Books 37.20(20 December1990).print "
2. TripiLahiri, By the Numbers: Where Indian Women Work, Women's Studies Journal(14 November2012)<http://blogs.wsj.com/Indiareal time/2012/11/14/by-the- numbers-where-Indian-Women-work/>
3. K. Satyanarayanaand Susie Tharu(Ed.) Steal Nibs Are Sprouting: New Dalit Writing From SouthIndia,Dossier 2:Telugu and Kannada
4. Vimala. "Vantillu (the kitchen)". Women writing in India: 600 BC to the present volumeII; The20thcentury. Ed. Susie Tharuand K.Lalita. Delhi: Oxford university press, 1995, 599-601.
5. Shatrughn a, veena et al. women's work and its impact on child health and nutrition, Hyderabad, national institute of nutrition, Indian council of medical research. 1993.
6. Gautam,Lielaand Gita Ramaswamy. "A 'Conversation' between a Daughter and a Mother". Broadsheet on contemporary Politics, special issue on sexuality and harassment; Gender politics on campus today, Ed. Madhumeeta Sinha and Asma Rasheed. Hyderabad: Anveshi Research center for women's Studies, 2014.

7. Abdulali Sohaila. “If ought for my life….and won”. Available online at:http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/
8. Virginia Woolf. A Room of one’s own. Oxford; Black swan. 1992.

***Outcomes**:*

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a clear grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the text book will empower students to understand and respond to gender violence in a mature way.

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II B.Tech. I Semester

7GC32-ENGINEERING MATHEMATICS III

L	T	P
3	1	-

Course Objectives:

- The subject gives the knowledge about the solution of algebraic and transcendental equations and to solve differential equations by numerical methods.
- The course intends to provide an over view about interpolation, numerical differentiation and integration.
- The course explains the concept of curve fitting and partial differential equations.
- The course provides an opportunity to learn how to solve Fourier series and Fourier integral transforms in all engineering fields.

UNIT I

Solution of algebraic and Transcendental Equations-Bisection Method-Method of false Position-Newton-Raphson method.

Numerical solutions of ordinary differential Equations-Taylor's Series-Euler's methods–Runge-Kutta fourth order Method-Milne's predictor-corrector method. (Without proofs)

UNIT II

Interpolation - Introduction – Forward Differences – Backward Differences – Newton's forward and backward difference interpolation formulae – Lagrange's Interpolation formula.

Numerical Differentiation - Numerical Integration – Trapezoidal rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule.

UNIT III

Curve fitting: Fitting a straight line-second degree parabola-Exponential curve –power curve by the method of least squares.

Partial differential equations: Formation of partial differential equations by eliminating arbitrary constants and arbitrary functions-solutions of linear equation–Nonlinear equation by Charpit's method-Method of separation of variables.

UNIT IV

Fourier series: Determination of Fourier coefficients-Fourier series of even and odd functions-Fourier series in an arbitrary interval-half range Fourier sine and cosine expansions.

UNIT V

Fourier Integrals and Fourier transforms: Fourier Integral theorem-Fourier Transforms-Fourier sine transform - Fourier Cosine Transform-Properties-Inverse Transforms -Finite Fourier sine and Cosine Transforms.

Text Books:

Higher Engineering Mathematics, B. S. Grewal, 42nd edition, Khanna Publishers, New Delhi.

References:

1. Advanced Engineering Mathematics, Erwin Kreyszig, 8th edition, New Age International (Pvt) Limited.
2. A text book of Engineering Mathematics, B. V. Ramana, Tata McGraw Hill.
3. Mathematical Methods, T. K. V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company.

Course Outcomes:

Student will be able to

1. Apply the knowledge of numerical methods to solve algebraic, transcendental and ordinary differential equations.
2. Improve the ability of data analysis in numerical differentiation and integration with the help of interpolation.
3. Derive the equations of various curves by the method of least squares to assess the relation between them and to solve partial differential equations.
4. Derive Fourier series for the given periodic function in any arbitrary intervals.
5. Apply the knowledge of Fourier integrals and Fourier transforms to solve differential equations.

Mapping of COs and POs

Course Outcomes	Program outcomes												Program Specific Outcomes	
	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
1	3	-	-	-	3	-	-	-	-	-	-	2	3	-
2	3	3	-	2	-	-	-	-	-	-	-	1	3	-
3	3	-	-	3	2	-	-	-	-	-	-	2	3	-
4	3	2	-	-	-	-	-	-	-	-	-	2	3	-
5	3	2	-	-	2	-	-	-	-	-	-	3	3	-

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II B.Tech. I Semester

7G231-DC MACHINES

L	T	P
3	1	-

Course Objectives:

- To impart knowledge on construction and operational aspects of various types of DC machines.
- To develop skills in analyzing and evaluating the operation and performance of DC machine for various operating conditions.
- To inculcate attitude of applying the conceptual knowledge of DC machines to meet the societal needs.

UNIT I

DC GENERATORS –CONSTRUCTION & OPERATION: Basic Constructional features of dc generators - principle of operation - function of commutator-armature windings - Lap and Wave windings (Qualitative treatment only) - equalizer rings and dummy coils, E.M.F equation, problems.

UNIT II

TYPES OF DC GENERATORS & ARMATURE REACTION: Methods of excitation - separately excited and self-excited generators - Losses - reduction of losses - efficiency - Armature reaction - Cross magnetizing and de-magnetizing AT/pole – commutation process - reactance voltage - methods of improving commutation- compensating winding.

UNIT III

CHARACTERISTICS & PARALLEL OPERATION OF DC GENERATORS: Causes of failure of self-excitation and remedial measures-O.C.C - Internal and External Characteristics.

Parallel operation of DC generators - use of equalizer bar and cross connection of field windings - load sharing.

UNIT IV

PRINCIPLE & SPEED CONTROL OF DC MOTORS: D.C Motors - Principle of operation - Back E.M.F. - Torque equation - characteristics of shunt, series and compound motors - Speed control of DC Shunt Motors - Armature voltage and field flux control methods - Ward-Leonard system - Speed control of DC Series Motors -3 point and 4 point starters, and Applications of DC motors.

UNIT V

TESTING OF DC MACHINES: Brake test - Swinburne's test - Hopkinson's test - Field's test - Retardation test - separation of stray losses in a DC motor.

Text Books:

1. I.J. Nagrath & D.P. Kothari, Electrical Machines. Tata McGraw – Hill Publishers, New Delhi, 4th Edition, 2010.
2. P.S. Bimbhra, Electrical Machinery. Khanna Publishers. New Delhi, 7th Ed, 2011.

References:

1. JB Gupta, Theory and Performance of Electrical Machines (DC machines, Poly phase circuits & AC machines) in SI Units. S.K. KATARIA & Sons, New Delhi, 2013.
2. Albert E Clayton & N N Hancock, Performance and Design of Direct Current Machines. CBS Publishers, New Delhi, 2004, 3rd Ed.
3. S.K. Bhattacharya, Electrical Machines. Tata McGraw Hill Publishers, New Delhi, 4th edition, 2014.
4. A.E. Fitzgerald, C.Kingsley and S.Umans, Electric Machinery. McGraw-Hill Companies, New Delhi, 2013, 7th Ed.

Course Outcomes:

On successful completion of the course, students will be able

1. To demonstrate knowledge on
    a. Construction, operation of various types of DC machines.
    b. Armature reaction and commutation.
    c. Characteristics of DC machines.
    d. Parallel operation of DC generators.
    e. Starting, braking and speed control of DC motors.
    f. Testing of DC machines.
2. Analyze the operation and performance of DC machine for various operating conditions.
3. Design suitable accessories / controllers for desired operation of DC Machines.
4. Solve engineering problems pertaining to DC machines and provide feasible solutions.
5. Select appropriate techniques and tools for DC machines and configurations of DC machines for domestic and industrial applications.
6. Apply the conceptual knowledge of DC machines in relevance to societal needs.

Mapping of COs and POs

Course Outcomes	Program Outcomes												Program Specific Outcomes	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**PSO1**	**PSO2**
1	3	-	-	-	-	-	-	-	-	-	-	-	3	-
2	2	3	-	-	-	-	-	-	-	-	-	-	3	-
3	1	2	3	-	-	-	-	-	-	-	-	-	3	-
4	2	2	2	3	-	-	-	-	-	-	-	-	-	3
5	1	2	-	-	3	-	-	-	-	-	-	-	-	3
6	1	-	-	-	-	3	-	-	-	-	-	-	-	-

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II B.Tech. I Semester

7G232-SWITCHING THEORY AND LOGIC DESIGN

L	T	P
3	1	-

Course Objective:

- To understand the concepts and techniques associated with the number systems and codes.
- To minimize the logical expressions using Boolean postulates.
- To design various combinational and sequential circuits.

UNIT I

NUMBER SYSTEMS, CODES & BOOLEAN ALGEBRA: Philosophy of number systems – r, (r-1)'s complement, representation of negative numbers, Binary arithmetic, Binary codes, Error detecting & Error correcting codes, hamming codes.

Boolean Algebra: Fundamental postulates of Boolean algebra, Basic theorems and Properties, Logic gates, Properties of XOR gate, universal gates.

UNIT II

SWITCHING FUNCTIONS AND THEIR MINIMIZATION: Switching Functions-Canonical and Standard forms, Algebraic simplification using Boolean theorems, two level & Multilevel Realization of Boolean Functions using Universal Gates.

Minimization: K-Map methods, Prime implicants, don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime-Implicant chart, simplification rules.

UNIT III

COMBINATIONAL LOGIC DESIGN & PROGRAMMABLE LOGIC DEVICES: Design using conventional logic gates-Binary Adders, Subtractors, Ripple Adder, Look Ahead carry adder, Magnitude comparator, Encoder, Decoder, Multiplexer, De-Multiplexer, Code-converters.

PLD's: ROM, PROM, PLA, PAL, and Realization of Switching functions using PLD's. Comparison between PLA, PAL, ROM.

UNIT IV

SEQUENTIAL CIRCUITS: Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples), Basic flip-flops, Triggering and excitation tables, flip flop conversions, Steps in synchronous sequential circuit design, Design of modulo-N Synchronous counters – up/down counter, ring counter, Johnson counter.

UNIT V

FSM MINIMIZATION AND ASM CHARTS: Finite state machine-capabilities and limitations, Mealy and Moore models and their conversions, minimization of completely specified sequential machines, Partition technique, Sequence detector.

Algorithmic State Machines: Salient features of the ASM chart.

Text Books:

1. M.Morris Mano, Digital Design. Pearson, 3rd Ed,2006.
2. Zvi Kohavi, Switching & Finite Automata Theory. TMH, 2nd Edition, 2008.

References:

1. Charles H. Roth, Jr.Larry L.Kinney. Fundamentals of Logic Design. Cengage Learning, 2015, 6th Ed.
2. William I. Fletcher, An Engineering Approach to Digital Design. Pearson, 3rd Ed,2015.
3. A.Anand Kumar, Switching Theory and Logic Design.2nd Edition, Prentice Hall of India, 2008.

Course outcomes:

By the end of this course, students will be able to

1. Demonstrate the knowledge in
   - Conversion of number systems, Binary Codes.
   - Basic theorems, properties and postulates of Boolean algebra.
   - Minimization of switching functions using Map method and Tabular method.
   - Combinational and sequential circuits.
   - Realization of Boolean functions using PLDs.
2. Analyze combinational and sequential circuits.
3. Design and develop various combinational, sequential circuits and PLDs.
4. Solve problems and arrive at solutions pertaining to Digital Electronics.
5. Apply minimization techniques to asynchronous and synchronous designs and suggest appropriate design for engineering solutions.
6. Apply appropriate logic functions to obtain optimized designs useful for the society.

Mapping of COs and POs

Course outcomes	Programme outcomes												Program Specific Outcomes	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**PSO1**	**PSO2**
1	2	3	3	-	3	-	-	-	-	-	-	3	1	-
2	2	3	3	-	3	-	-	-	-	-	-	3	3	-
3	2	3	3	-	3	-	-	-	-	-	-	3	2	2
4	2	3	3	2	3	-	-	-	-	-	-	3	3	3
5	-	3	3	2	-	-	-	-	-	-	-	3	3	3
6	-	3	3	2	-	-	-	-	-	-	-	3	2	3

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II B.Tech. I Semester

7G334-ANALOG ELECTRONICS-I

L	T	P
3	1	-

Course Objectives:

The course aims to provide the student with the ability

- To analyze and design the transistor amplifiers, feedback amplifiers.
- To design of oscillators, linear and nonlinear wave shaping.

UNIT I

SMALL SIGNAL ANALYSIS OF AMPLIFIERS: Introduction to h-parameter model, Small Signal model of BJT, Analysis of CB, CE and CC configurations using h-parameters – simplified hybrid model – miller's theorem – dual of miller's theorem. Analysis of Cascaded Transistor Amplifiers, RC Coupled amplifier, Frequency response of RC Coupled, Direct coupled and Transformer coupled amplifiers.

UNIT II

FEEDBACK AMPLIFIERS: Concept of Feedback, Classification of feedback amplifiers, Transfer Gain with feedback, General characteristics of negative feedback amplifiers. Voltage series, voltage shunt, current series, and current shunt feedback amplifiers with discrete components (Topologies).

UNIT III

OSCILLATORS: Condition for oscillations. Oscillator Types, Frequency and amplitude stability of oscillators, LC oscillators-Hartley and Colpitts oscillators, RC-phase shift and Wien bridge oscillators, Crystal Oscillators.

UNIT IV

LARGE SIGNAL AMPLIFIERS: classifications, Class A power Amplifiers-Direct coupled and Transformer Coupled, Class B power Amplifiers- Push-pull and Complementary Symmetry. Transistor power dissipation. Power and Efficiency calculations.

UNIT V

LINEAR WAVE SHAPING: High pass & low pass RC circuits, their response for sinusoidal, step, pulse, square, ramp and Exponential inputs.

NON-LINEAR WAVE SHAPING: Diode and Transistor clippers and clampers, clamping circuit theorem.

Text Books:

1. J. Millman and Christos C. Halkias- "Integrated Electronics", Mc Graw-Hill, 1972.
2. Robert T. Paynter- "Introductory Electronic Devices and Circuits", Pearson Education, 7th Edition.
3. J. Millman and H. Taub, "Pulse, Digital and Switching Waveforms", McGraw-Hill, second edition, 2007.

References:

1. Robert L. Boylestad and Louis Nashelsky - "Electronic Devices and Circuits Theory", Pearson/Prentice Hall, 9th Edition, 2006.
2. Donald A. Neumann- "Electronic Circuit Analysis and Design", Mc Graw Hill.
3. Anand Kumar, "Pulse and Digital Circuits", PHI, 2005.Second Edition.

Course Outcomes:

Upon completion of the course, student can

1. Analyze the single stage amplifiers using h-parameter model at low frequencies.
2. Design the feedback amplifiers and oscillators.
3. Design and analyze large signal amplifiers.
4. Design and analyze linear and nonlinear wave shaping circuits.

Mapping of COs and POs

Course Outcomes	Program Outcomes												Program Specific Outcomes	
	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
1	3	3	2	3	3	1	-	-	2	-	-	2	2	-
2	1	3	3	2	2	-	-	-	2	-	-	2	2	-
3	3	3	3	2	2	1	-	-	2	-	-	2	2	-
4	2	2	2	-	-	-	-	-	2	-	-	2	2	-

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II B.Tech. I Semester

7G233-ELECTRICAL CIRCUITS-I **L T P**

Course Objective: **3 1 -**

This course introduces the basic concepts of circuit analysis which is the foundation for all subjects of the Electrical Engineering discipline. The emphasis of this course is laid on the basic analysis of circuits which includes Basic concepts, 1-Φ AC circuits, Network theorems, Two port networks, Magnetic circuits and Network topology etc

UNIT I

BASIC CONCEPTS OF ELECTRICAL CIRCUITS: Voltage-Current Relationship for Passive Elements, Star-Delta Transformations, Voltage and Current division rules, Mesh, Super Mesh, Nodal and Super Node analysis, Duality & Dual Networks-Problems.

Network Topology: Basic Definitions – Graph – Tree, Basic Cutset and Basic Tieset Matrices for Planar Networks -Problems.

UNIT II

FUNDAMENTALS OF 1-Φ AC CIRCUITS: Advantages of AC supply, Types of AC waveforms, Importance of Sine Wave, Basic definitions: Cycle. Time period, frequency, Peak value, peak –peak value. Determination of Average, R.M.S Values, Peak and Form Factor for different Periodic Waveforms, Phase and Phase Difference, j-notation, Steady State Analysis of R, L and C with Sinusoidal Excitation, Concept of Reactance, Impedance, Susceptance and Admittance, Real and Reactive Power, Complex Power, Concept of Power Factor. Resonance – Definition, Resonant frequency, bandwidth and Q-factor for series and parallel resonant circuits, Problems.

UNIT III

NETWORK THEOREMS: Superposition, Thevenin's, Norton's, Maximum Power Transfer, Millman's, Reciprocity, Substitution, Compensation and Tellegen's Theorems for DC and AC excitations.

UNIT IV

TWO PORT NETWORKS: Two Port Network Parameters – Impedance, Admittance, Transmission and Hybrid Parameters and Their Relations, inter connections, Concept of Transformed Network - Two Port Network Parameters using Transformed Variables.

UNIT V

MAGNETICALLY COUPLED CIRCUITS: Coupled circuits – self & mutual inductance, Dot convention, Coefficient of coupling, Analysis of Magnetic circuits: Series, Parallel and Composite circuits, comparison of electrical and magnetic circuits.

Text Books:

1. A. Sudhakar & Shyam Mohan. Electric Circuits. 5th Edition, Tata McGraw Hill Company, 2015.
2. A. Chakrabarti. Circuit Theory. 6th edition, DhanpatRai& Co, New Delhi, 2014.

References:

1. M.E. Van Valkenberg. Network Analysis. 3rd edition, Pearson Publications, New Delhi 2006.
2. William H. Hayt & Jack E. Kennedy & Steven M. Durbin. Engineering Circuit Analysis. 8th edition, TATA McGraw Hill Company, 2013.
3. J.A.Edminister & M.D.Nahvy. Theory and Problems of Electric Circuits. 4th Edition Schaums Outline series, New Delhi TATA McGraw Hill Company, 2004.
4. G. K. Mittal, Ravi Mittal. Network Analysis. 14th Edition, Khanna Publishers, New Delhi, 1997.
5. C. K. Alexander and M. N. O. Sadiku. Fundamentals of Electric Circuits. 5th Edition, Tata McGraw hill Publishing Company Limited, New Delhi, 2012.

Course Outcomes:

By the end of this course, students will be able to

- Analyze the Basics of Electrical Circuits.
- Analyze 1-Φ AC circuits.
- Analyze the Phenomenon of Resonance.
- Solve electric circuits using network theorems.
- Compute Two port Network parameters.
- Analyze magnetic circuits.
- Compute the Incidence Matrices using Network topology.

Mapping of COs and POs

Course Outcomes	Program Outcomes												Program Specific Outcomes	
	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
1	3	3	3	-	-	-	-	-	-	-	-	-	3	-
2	3	3	3	-	-	-	-	-	-	-	-	-	3	-
3	3	3	3	-	-	-	-	-	-	-	-	-	3	-
4	3	3	3	-	-	-	-	-	-	-	-	-	3	-
5	3	3	3	-	-	-	-	-	-	-	-	-	3	-
6	3	3	3	-	-	-	-	-	-	-	-	-	3	-
7	3	3	3	-	-	-	-	-	-	-	-	-	3	-

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II B.Tech. I Semester

7G536-FLUID MECHANICS AND HYDRAULIC MACHINES **L T P**

Course Objective: **3 1 -**

- To give insight knowledge on fluid statics and kinematics
- To gain knowledge on fluid dynamics
- To give basic understanding of Hydro Electric power plant and importance of impact of jets.
- To become familiar about different types of turbines and able to analyze the performance characteristics of various turbines.
- To be able to understand the working of power absorbing devices like pumps and able to analyze their performance characteristics

UNIT I

FLUID STATICS: Dimensions and units: physical properties of fluids-specific gravity, viscosity surface tension- vapour pressure and their influence on fluid motion- atmospheric gauge and vacuum pressure – measurement of pressure- Piezometer, U-tube and differential manometers.

FLUID KINEMATICS: Stream line, path line and streak lines and stream tube, classification of flows-steady & unsteady, uniform & non-uniform, laminar & turbulent, rotational & irrotational flows, Equation of continuity for one dimensional flow.

UNIT II

FLUID DYNAMICS: Surface and body forces –Euler's and Bernoulli's equations for flow along a stream line, momentum equation and its application on force on pipe bend. CLOSED CONDUIT FLOW: Reynold's experiment-Darcy Weisbach equation- Minor losses in pipes- pipes in series and pipes in parallel- total energy line-hydraulic gradient line. Measurement of flow: Pitot tube, venture meter and orifice meter.

UNIT III

HYDROELECTRIC POWER STATIONS: Elements of hydro electric power station-types. Concept of pumped storage plants- storage requirements.

BASICS OF TURBO MACHINERY: Hydrodynamic force of jets on stationary and moving flat, inclined, and curved vanes, jet striking centrally and at tip, velocity diagrams, work done and efficiency, flow over radial vanes.

UNIT IV

HYDRAULIC TURBINES: Classification of turbines, impulse and reaction turbines, Pelton wheel, Francis turbine and Kaplan turbine-working proportions, work done, efficiencies, hydraulic design –draft tube theory- functions and efficiency. PERFORMANCE OF HYDRAULIC TURBINES: Geometric similarity, Unit and specific quantities, characteristic curves, governing of turbines, selection of type of turbine, cavitation, surge tank, water hammer.

UNIT V

CENTRIFUGAL PUMPS: Classification, working, work done – manometric head- losses and efficiencies specific speed- pumps in series and parallel- performance - characteristic curves, NPSH.

RECIPROCATING PUMPS: Working, Discharge, slip, indicator diagrams.

Text Books:

1. Modi and Seth, *Hydraulics, fluid mechanics and Hydraulic machinery*, Standard Book house
2. R. K. Bansal, *Fluid Mechanics and Hydraulic Machines*.

References:

1. D.S. Kumar, *Fluid Mechanics and Fluid Power Engineering.*Kotaria& Sons.
2. D. Rama Durgaiah, *Fluid Mechanics and Machinery*. New Age International.
3. Banga& Sharma, *Hydraulic Machines.*Khanna Publishers.
4. James W. Dally, William E. Riley, *Instrumentation for Engineering Measurements*. John Wiley & Sons Inc.
5. Raj put, *Fluid Mechanics and Hydraulic Machines*.

Course Outcomes:

1. An ability to gain the knowledge on fluid mechanics fundamentals like fluid statics and fluid kinematics
2. Students shall have basic idea about the fundamental equations used in Fluid Dynamics and are able to apply these concepts in real working environment
3. An ability to study the fundamentals of turbo machinery and elements of hydro electric power plant.
4. An ability to measure the performance of the different types of Hydraulic Turbines
5. An ability to calculate the performance of the different types of Hydraulic Pumps

MAPPING OF COs AND POs

Course Outcomes	Program Outcomes											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1	3	3	3	-	3	-	3	-	-	-	-	-
2	3	3	3	-	3	-	3	-	-	-	-	-
3	3	3	3	3	-	3	3	-	-	1	-	-
4	3	3	3	3	3	3	3	-	2	-	-	-
5	3	3	3	3	3	3	3	-	2	-	-	-

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II B.Tech. I Semester

7G235-ELECTRICAL CIRCUITS LAB	**L**	**T**	**P**
	-	**-**	**3**

Any **TEN** experiments to be conducted from the following

1. Verification of Mesh and Nodal Analysis.
2. Verification of Thevenin's and Norton's theorem.
3. Verification of superposition theorem.
4. Verification of Maximum Power Transfer Theorem.
5. Verification of Compensation theorem.
6. Verification of Reciprocity and Milliman's Theorems.
7. Determination of Self Inductance, Mutual Inductance and Co-efficient of Coupling of a single-phase transformer.
8. Determination of equivalent inductance for aiding and opposing fluxes.
9. Series and Parallel Resonance.
10. Determination of Impedance and Admittance Parameters.
11. Determination of transmission and Hybrid Parameters.
12. Time Response of RL and RC circuits.
13. Locus diagrams of RL and RC circuits.

Course Outcomes

On completion of the lab student will know

1. The verifications of Thevenin's Norton's, superposition, Maximum power, Compensation, Reciprocity, Millman's theorem
2. Student will able to draw Locus diagrams and resonance diagram for series and parallel circuits.
3. Students will be able to find different network parameters.

Mapping of COs and POs

Course Outcomes	Program Outcomes												Program Specific Outcomes	
	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
1	3	3	3	-	3	-	-	-	-	-	3	-	3	-
2	3	3	3	-	3	-	-	-	-	-	3	-	3	-
3	3	3	3	-	3	-	-	-	-	-	3	-	3	-
4	3	3	3	-	3	-	-	-	-	-	3	-	3	-
5	3	3	3	-	3	-	-	-	-	-	3	-	3	-
6	3	3	3	-	3	-	-	-	-	-	3	-	3	-
7	3	3	3	-	3	-	-	-	-	-	3	-	3	-

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II B.Tech. I Semester

7G53B-FLUID MECHANICS AND HYDRAULIC MACHINES LAB

L	T	P
-	-	3

Any **Ten** of the following experiments are to be conducted

1. Impact of jets on Vanes.
2. Performance Test on Pelton Wheel.
3. Performance Test on Francis Turbine.
4. Performance Test on Kaplan Turbine.
5. Performance Test on Single Stage Centrifugal Pump.
6. Performance Test on Multi Stage Centrifugal Pump.
7. Performance Test on Reciprocating Pump.
8. Calibration of Venturimeter.
9. Calibration of Orifice meter.
10. Determination of friction factor for a given pipe line.
11. Determination of loss of head due to sudden contraction in a pipeline.
12. Turbine flow meter.

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II B.Tech. I Semester

7GC34-ADVANCED ENGLISH COMMUNICATION SKILLS LAB **L T P**
- - 3

Résumé Preparation – structure, formats and styles – planning - defining career objective - projecting one's strengths and skills - creative self-marketing– sample resumes - cover letter

Interview Skills- concept and process - pre-interview planning – preparation - body language - answering strategies – frequently asked questions

Group Discussion –communicating views and opinions – discussing – intervening – agreeing and disagreeing –asking for and giving clarification - substantiating - providing solution on any given topic across a cross-section of individuals - modulation of voice and clarity - body language – case study

Oral Presentations (Individual& Team) – collection of data from various sources –planning, preparation and practice – attention-gathering strategies - transitions – handling questions from audience

Listening Comprehension – listening for understanding - responding relevantly

Learning Resources: AECS Lab Manual prepared by Dept of HS, AITS Rajampet

Course Outcomes:

Student will be able to

1. express himself fluently in social and professional contexts
2. enhance his skills of making a presentation confidently
3. learn how to face Interviews confidently, to participate in meetings effectively
4. face CBTs with greater felicity

Mapping of COs and POs

Course Outcomes	Program Outcomes												Program Specific Outcomes	
	1	2	3	4	5	6	7	8	9	10	11	12	POS1	PSO2
1	-	-	-	-	-	-	-	-	-	2	-	3	-	-
2	-	-	-	-	-	-	-	-	-	3	-	3	-	-
3	-	-	-	-	-	-	-	-	-	2	-	1	-	-
4	-	-	-	-	-	-	-	-	-	1	-	2	-	-

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II B.Tech. II Semester

7GC43-COMPLEX VARIABLES AND SPECIAL FUNCTIONS

(Common to EEE & ECE)

L	T	P
3	1	-

Course Objectives:

- The course aims to provide the student with the ability **t**o understand the complex variables and their functions.
- The course provides the student with an opportunity to apply the knowledge to evaluate the complex integrals in real life situations.
- The course offers knowledge to solve the problems of complex integration by evaluation of residue and residue theorem.
- The course explains Rouches theorem and Argument principle to determination of zeros of complex functions.
- The course enables the students solve the problems of bilinear transformation by Cross ratio**.**

UNIT I

Beta and Gamma Functions: Beta and Gamma functions their properties – Evaluation of improper integrals using Beta and Gamma functions.

Complex variables: Exponential, trigonometric, hyperbolic functions and their properties – General power z^c (c is complex), principal value.

UNIT II

Functions of complex variables: Continuity – Differentiability – Analyticity – Properties – Cauchy – Riemann equations in Cartesian and polar coordinates. Harmonic and conjugate harmonic functions – Milne – Thompson method.

UNIT III

Complex Integration: Line integral – Evaluation along a path and by indefinite integration – Cauchy's integral theorem – Cauchy's integral formula – Generalized integral formula (without proof).

Complex power series: Radius of convergence – Expansion in Taylor's series, Maclaurin's series and Laurent series (with out proof).

UNIT IV

Residues: Singular point – Isolated singular point – Pole of order m – Essential singularity. Residue – Evaluation of residues – Residue theorem. Evaluation of integrals of the types $\int_{-\infty}^{\infty} f(x)dx \; and \; \int_0^{2x} f(cos\theta, sin\theta)d\theta$.

Determination of zeros: Argument principle-Rouche's theorem

UNIT V

Conformal mapping: Definition – Translation, rotation, and inversion –- Transformation by $e^z, 1n\ z, z^n, \sin z, \cos z$. Bilinear transformation -Fixed points – Cross ratio – Determination of bilinear transformation mapping for three given points.

Text Books:

Higher Engineering Mathematics, B. S. Grewal, 43rdedition, Khanna Publishers, New Delhi, 2014.

References:

1. Advanced Engineering Mathematics, Erwin Kreyszig, 8thEdition, New Age International (Pvt) Limited.
2. A text book of Engineering Mathematics, B. V. Ramana, Tata McGraw Hill.
3. Mathematics - II, T. K. V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company.
4. Mathematics - III, E. Keshav Reddy and Rukmangadachari, Pearson Education.
5. A text book of Engineering Mathematics, N.P.Bali, Laxmi publications.

Course Outcomes:

Student will be able to

1. Understand the properties of beta and gamma functions
2. Have the knowledge on functions of a complex variable
3. Understand the concepts of exponential, trigonometric, hyperbolic functions and their properties.
4. Have the knowledge of complex integration and apply it to solve complex integrals of different type.
5. Learn about conformal mapping.

Mapping of COs and POs

Course Outcomes	Program Outcomes												Program Specific Outcomes	
	1	2	3	4	5	6	7	8	9	10	11	12	PSO 1	PSO 2
1	3	-	-	-	3	-	-	-	-	-	-	2	-	-
2	3	3	-	2	-	-	-	-	-	-	-	1	-	-
3	3	-	-	3	2	-	-	-	-	-	-	2	-	-
4	3	2	-	-	-	-	-	-	-	-	-	2	-	-
5	3	2	-	-	2	-	-	-	-	-	-	3	-	-

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II B.Tech. II Semester

7G241-AC MACHINES-I

L	T	P
3	1	-

Course Objective:

As an extension of Electrical machines-I course, this subject facilitates to study the performance of Transformers and Induction motors which are the major part of Transmission of electrical power, industrial drives and agricultural pump sets.

UNIT I

CONSTRUCTION & OPERATION OF SINGLE PHASE TRANSFORMERS: Single phase transformer - types - constructional details - emf equation - operation on no-load and on load - phasor diagrams - Losses - minimization of core losses - effect of variations of frequency & supply voltage on core losses.

UNIT II

PERFORMANCE OF SINGLE PHASE TRANSFORMERS: Equivalent circuit - Efficiency - regulation - OC and SC tests, Polarity test - Sumpner's test - predetermination of efficiency and regulation - separation of core losses test - Auto transformers - comparison with two winding transformers - All day efficiency.

UNIT III

THREE - PHASE TRANSFORMERS: Three-Phase transformers types, connections - Y/Y, Y/Δ, Δ/Y, Δ/Δ - Parallel operation - open Δ and Scott connection (Qualitative treatment only).

UNIT IV

THREE-PHASE INDUCTION MOTORS: Three-Phase induction motors construction - production of R.M.F. - principle - Effect of slip on rotor parameters at standstill and during operation - Rotor power input, rotor copper loss and mechanical power developed and their interrelation-torque equation - expressions for maximum torque and starting torque - torque slip characteristics - double cage and deep bar rotors - crawling and cogging.

UNIT V

Circle diagram, starting & speed control of three-phase induction motors: No - Load and blocked rotor tests - stator resistance test - Circle diagram - predetermination of performance - methods of starting - starting current and torque calculations - speed control - change of frequency, voltage, rotor resistance, cascade connection - Induction Generator -principle of operation.

Text Books:

1. I.J. Nagrath & D.P. Kothari, Electrical Machines. Tata McGraw – Hill Publishers, New Delhi, 4th Edition, 2010.
2. P.S. Bimbhra, Electrical Machinery. Khanna Publishers. New Delhi, 7th Ed, 2011.

References:

1. JB Gupta, Theory and Performance of Electrical Machines (DC machines, Poly phase circuits & AC machines) in SI Units. S.K. KATARIA & Sons, New Delhi, 2013.
2. A.E. Fitzgerald, C.Kingsley and S.Umans, Electric Machinery. McGraw-Hill Companies, New Delhi, 2013, 7th Ed.
3. MG.Say, Performance and Design of AC Machines, 3rd edition, BPB Publishers, 2002.
4. Langsdorf, Theory of Alternating Current Machinery. Tata McGraw-Hill Companies, 2nd Ed, 2004.
5. B.L. Theraja & A.K. Theraja, A. text of Electrical Technology in SI units Vol: II. S. Chand publishers, 23rd edition 2006.

Course Outcomes:

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

1. Demonstrate knowledge on
   - Construction, operation of Transformers, Auto transformers & Induction machines.
   - Testing of transformers and induction machines.
   - Characteristics of induction motors.
   - Parallel operation of transformers.
   - Starting and speed control of induction motors.
2. Analyze the operation and performance of Transformers & Induction machines for various operating conditions.
3. Design suitable accessories / techniques for the starting and speed control of induction motors.
4. Solve engineering problems pertaining for transformers and induction machines to provide viable solutions.
5. Select appropriate techniques and tools for desired operation of transformers and induction machines in domestic, agriculture and industrial applications.
6. Apply the conceptual knowledge of Transformers and Induction Machines in relevance to industry and society.

Mapping of COs and POs

Course Outcomes	Program Outcomes												Program Specific Outcomes	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**PSO1**	**PSO2**
1	3		-	-	-	-	-	-	-	-	-	-	3	-
2	2	3	-	-	-	-	-	-	-	-	-	-	3	-
3	1	2	3	-	-	-	-	-	-	-	-	-	3	-
4	2	2	2	3	-	-	-	-	-	-	-	-	-	3
5	1	2	-	-	3	-	-	-	-	-	-	-	-	3
6	1	-	-	-	-	3	-	-	-	-	-	-	-	-

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II B.Tech. II Semester

L	T	P
3	1	-

7G345-ANALOG ELECTRONICS-II

Course Objectives:

The course aims to provide the student with the ability

- To Understand the Concepts of differential amplifier and OP-Amp.
- To analyze, Timers, PLL and converters.

UNIT I

INTRODUCTION TO IC: IC Classifications, IC chip size and Circuit complexity, Operational amplifiers: Basic Information of Op-amp, Ideal op-amp, Internal Circuit, DC& AC Characteristics.

UNIT II

LINEAR APPLICATIONS OF OPAMP: Inverting and non-inverting summing amplifier, subtractor, adder - subtractor, integrator, differentiator, instrumentation amplifier, V-I & I-V converters.

UNIT III

NON-LINEAR APPLICATIONS OF OPAMP: Comparators and applications, Multivibrators- astable and monostable, Schmitt trigger, Triangular and saw tooth wave generators, Log and antilog amplifiers, precision rectifiers.

UNIT IV

TIMERS AND PHASE LOCKED LOOPS: Introduction to 555 Timer, functional diagram, Monostable and Astable operations and applications, Schmitt Trigger, PLL-Introduction, Block schematic, principles and description of individual blocks,565 PLL, applications of PLL-Frequency multiplication, frequency translation, AM, FM and FSK demodulators.

UNIT V

D-A AND A-D CONVERTERS: Introduction, Basic DAC techniques, weighted resistor DAC, R-2R Ladder DAC, Inverted R-2R DAC monolithic DAC, ADCs-parallel comparator type ADC, counter type ADC, servo or tracking ADC, successive approximation ADC, Dual slope ADC, DAC and ADC specifications.

Text Books:

1. Ramakanth A. Gayakwad - Op-Amps & Linear ICs , 3rd edition, PHI, 2001.
2. D. Roy Chowdhury - Linear Integrated Circuits , New Age International (p) Ltd, 4th Edition, 2010.

References:

1. David A. Bell - Operational Amplifiers & Linear ICs, 2nd edition, Oxford University Press, 2010.
2. Sergio Franco - Design with Operational Amplifiers & Analog Integrated Circuits, McGraw Hill, 1988.
3. C.G. Clayton Operational Amplifiers, Butterworth & Company Publ. Ltd./ Elsevier, 1971.

Course Outcomes:

On completion of the course, students will

1. Understand the analysis of differential amplifier and characteristics of OP-Amp.
2. Design Op-Amp circuits for liner & non linear applications.
3. Design different analog filters
4. Understand the applications of 555 timer and PLL.
5. Understand the principles of converters.

Mapping of COs and POs

Course Outcomes	Program Outcomes												Program Specific Outcomes	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**PSO1**	**PSO2**
1	3	3	3	3	2	-	-	-	1	-	-	-	3	-
2	3	3	2	3	2	-	-	-	1	-	-	-	3	-
3	2	3	2	3	2	-	-	-	1	-	-	-	2	-
4	1	2	2	3	1	2	-	2	-	-	-	-	1	-
5	1	2	2	2	3	-	-	-	1	-	-	-	1	-

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II B.Tech. II Semester

7G242-ELECTROMAGNETIC FIELDS

L	T	P
3	1	-

Course Objective:

To provide the basic skills required to understand, develop, and design various engineering applications involving electromagnetic fields.

Review of Vector Algebra:

Scalar and vector fields - Vector algebra - Cartesian, Circular Cylindrical and Spherical co-ordinate systems-Divergence Theorem - Stoke's Theorem

UNIT I

ELECTROSTATICS-I: Electrostatic Fields-Coulomb's law - Electric Field Intensity (EFI) - Various Charge Distributions - EFI due to a Continuous charge distribution- infinite line and infinite surface charge -Electric Flux Density-Gauss's Law -Applications of Gauss law to symmetrical charge distributions (int, Infinite line and Infinite Surface distributions) and differential volume element - Maxwell's first equation. Energy expended in moving a int charge in an electric field-Maxwell's second equation.

UNIT II

ELECTROSTATICS-II: Potential Definition-Potential for different Charge distributions-energy density in electrostatic fields-Potential Gradient. Electric Dipole-Dipole moment - potential and EFI due to an electrical Dipole-Torque on an Electric Dipole in an electric field-Current density - conduction and convection current density - Polarization, Boundary Conditions Capacitance-capacitance of parallel plate, Spherical and Co-axial capacitors with composite dielectric Laplace's and poison's equations.

UNIT III

MAGNETOSTATICS-I: Static magnetic fields-Biot-Savart's law, Magnetic Field Intensity (MFI) - MFI due to a straight current carrying filament, Circular, Solenoid current carrying wire- Relation between magnetic flux, Magnetic flux density and MFI. Ampere's Circuital law - Maxwell's third equation-Applications of Ampere's law to infinite line current, Infinite sheet of current, Infinitely long co-axial transmission line, Scalar magnetic potential and its limitations-Vector magnetic potential- Maxwell's fourth equation

UNIT IV

MAGNETOSTATICS-II: Magnetic Forces- Force on moving charges, - Lorentz force equation, Force on a current element -Force on a straight and long current carrying conductor in magnetic field-Force between two straight long and parallel current carrying conductors. Magnetic Dipole and Dipole moment - Torque on a current loop placed in a magnetic field. Magnetization - Magnetic Boundary conditions. Self-Inductance of a solenoid, Co-axial cable, energy stored and density in magnetic field.

UNIT V

ELECTRODYNAMIC FIELDS: Time varying fields - Faraday's laws of electromagnetic induction - statically and dynamically induced EMF – simple problems. Modifications of Maxwell's equations for time varying fields (int forms and Integral forms) - displacement current - poynting theorem and poynting vector.

Text Books:

1. Sadiku. Elements of Electromagnetic Fields. 6th edition, Oxford Publications.
2. William H. Hayt & John A. Buck. Engineering Electromagnetics. 7th Edition, Mc. Graw Hill Companies, 2006.
3. U.A.Bakshi, A.V.Bakshi, Electromagnetic Fields, Technical Publications.

References:

1. J D Kraus. Electromagnetics. 4th Edition, Mc Graw Hill, 1992.
2. K.A.Gangadhar & P.M. Ramanathan. Field Theory. 5th edition, Khanna publishers, New Delhi, 2003.
3. Ashutosh Pramanik. Electromagnetics Theory & Applications. 2nd Edition.PHI

Course Outcomes:

At the end of this the student Can

1. Analyze the different aspects related to Static Electric Fields and Corresponding Maxwell's equations.
2. Understand the Significance of polarization and Capacitance in Static Electric Fields.
3. Analyze the different concepts related to Static Magnetic Fields and Corresponding Maxwell's equations.
4. Learns the Significance of Magnetization and Inductance in Static Magnetic Fields.
5. Demonstrate the physical significance of Time Varying Electromagnetic Fields through corresponding Maxwell's equations.

Mapping of COs and POs

Course Outcomes	Program Outcomes												Program Specific Outcomes	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**PSO1**	**PSO2**
1	3	2	1	3	-	-	-	-	-	-	-	-	3	-
2	2	-	-	-	-	-	2	-	-	-	-	-	3	-
3	3	-	-	3	-	-	-	-	-	-	-	-	3	-
4	3	2	-	-	-	-	-	-	-	-	1	1	3	-
5	3	-	1	1	-	-	-	-	-	-	-	-	3	-

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II B.Tech. II Semester

7G243-LINEAR CONTROL SYSTEMS

L	T	P
3	1	-

Course Objective:

To provide an introduction to the analysis of linear control systems. This will permit an engineer to exploit time domain and frequency domain tools.

UNIT I

INTRODUCTION: Concepts of Control Systems-Classification- Open Loop and closed loop control systems and their differences-Examples- Feed-Back Characteristics, Effects of feedback-Mathematical models-differential Equations-Transfer Function-Mechanical Translational & Rotational systems, electrical analogy — Block Diagram representation of systems considering electrical systems as examples- Block diagram algebra, Signal Flow graph and Mason's gain formula. Transfer function of DC servo motor – AC servo motor -synchro transmitter and receiver.

UNIT II

TIME RESPONSE ANALYSIS: Types of test signals, Type and Order of a systems, Time Response of first and second order system, Time domain specifications- and– steady state error – static error constants – generalized error coefficients, Effects of proportional, integral, derivative Controllers.

UNIT III

STABILITY ANALYSIS: Concepts of stability: Characteristic equation, location of roots in s-plane for stability, asymptotic stability and relative stability, Routh-Hurwitz stability criterion- Root locus concept - construction of root loci.

UNIT IV

FREQUENCY RESPONSE ANALYSIS: Introduction, Frequency domain specifications-Bode Diagrams-Determination of Frequency domain specifications -Stability Analysis from Bode Plots. Polar Plots-Nyquist Plots-Phase margin and Gain Margin-Stability Analysis.

UNIT V

Design and Compensation Techniques: Compensation techniques – Lag, Lead, Lead-Lag Compensators design using Bode Plot

State Space Analysis

Concepts of state, state variables and state model-derivation of state model for physical systems, Diagonalization- State transition Matrix and its properties – Solution of linear state equation – Concepts of controllability and Observability.

Text Books:

1. Katsuhiko Ogata "Modern Control Engineering" — Prentice Hall of India Pvt. Ltd., 5th edition, 2010
2. I.J.Nagrath and M. Gopal "Control Systems Engineering" New Age International (P) Limited, Publishers, 5th edition, 2007.

References:

1. Control Systems Engineering - by NISE 5th Edition – John wiley& sons, 2010.
2. Control Systems –by A. NagoorKani– First Edition RBA Publications, 2006.
3. Automatic Control Systems– by B. C. Kuo and Farid Golnaraghi John wiley and son's, 8th edition, 2003.

Course Outcomes:

At the end of this the student Can

1. To Understand the basic components of control systems.
2. To Gain knowledge in various time domain and frequency domain tools for analysis and design of linear control systems and compensators.
3. To Understand the methods to analyze the stability of systems from transfer function forms.
4. To Understand the concept of state variable analysis.

Mapping of COs and POs

Course Outcomes	Program Outcomes												Program Specific Outcomes	
	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
1	2	2	2	-	2	-	-	-	-	-	-	-	3	-
2	3	3	3	-	2	-	-	-	-	-	3	3	3	3
3	1	1	1	-	2	-	-	-	-	-	-	-	3	-
4	1	1	1	-	2	-	-	-	-	-	3	3	3	-

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II B.Tech. II Semester

L	T	P
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7G244- ELECTRICAL CIRCUITS-II

Course Objective:

This course introduces the basic concepts of circuit analysis which is the foundation for all subjects of the Electrical Engineering discipline. The emphasis of this course is laid on the basic analysis of three phase circuits, transient analysis, applications of Laplace and Fourier transforms and network synthesis techniques etc.

UNIT I

THREE PHASE CIRCUITS: Phase Sequence - Star and Delta Connections-Relation between line, phase voltages and currents in balanced Systems - Analysis of balanced three Phase Circuits - Measurement of active and reactive power in balanced and unbalanced three phase systems - Analysis of three phase unbalanced circuits - Two wattmeter method of measurement of three phase power.

UNIT II

LAPLACE TRANSFORMS: Definition of Laplace transform – advantages - Laplace transform of important functions – inverse Laplace transform - application of Laplace transform to series RL, RC, RLC circuits – initial and final value theorem.

UNIT III

TRANSIENT ANALYSIS (AC & DC): DC Transient response of RL, RC and RLC series circuits –Initial Conditions-Solution method using differential equation, Transient response of RL, RC and RLC series circuits with AC excitation - Solution method using differential equation.

UNIT IV

FOURIER SERIES & FOURIER TRANSFORMS: Introduction – trigonometric Fourier series - evaluation of Fourier coefficients – waveform symmetry, exponential form of Fourier series, effective value, Fourier transforms & Properties.

UNIT V

NETWORK FUNCTIONS AND SYNTHESIS: Network functions-necessary conditions for driving point function-necessary conditions for transfer function – Hurwitz polynomials – positive Real functions - definitions and properties - synthesis of single port networks (RL, RC and LC networks).

Text Books:

1. A. Sudhakar, Shyammohan S Palli. Circuits and Networks. (Analysis and Synthesis), 3rd edition, Tata Mc GrawHill Publishing company Ltd.,
2. D. Roy Choudhury. Networks and Systems. 1st edition, New Age international publishers.

References:

1. A.Chakrabarthi. Circuit Theory (Analysis and Synthesis). 1st edition, Dhanpat Roi & Co. New Delhi, 2009
2. M.E. Van Valkenburg. Network analysis. 3rd edition, PHI.
3. William H Hayt, Jr. Jack E. Kemmerly, Steven M. Durbin. Engineering Circuit Analysis. 6th edition, Tata Mcgraw Hill publishing company Ltd.,
4. Umesh Sinha. Network Analysis and Synthesis. 5th edition, Satyaprakashan, New Delhi.
5. Engineering Network Analysis & Filter Design. Gopal Bhise G, Durgesh Kulshreshtha C, Prem Chadha R.

Course Outcomes:

1. Analyze Star and Delta Connections, Phase and Line quantities.
2. Emphasize power measurement in three phase circuits.
3. Analyze the applications of Laplace transforms and inverse Laplace transforms.
4. Analyze the transient response of electrical circuits for DC and AC excitations.
5. Analyze the applications of Fourier series and Fourier transforms.
6. Analyse the Network functions and Network Synthesis.

Mapping of COs and POs

Course Outcomes	**Program Outcomes**												**Program Specific Outcomes**	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**PSO1**	**PSO2**
1	2	2	-	2	-	-	-	-	-	-	-	-	3	-
2	1	1	-	1	-	1	-	-	-	-	-	-	3	-
3	3	3	3	3	-	-	-	-	-	-	-	-	3	-
4	3	3	-	-	-	-	-	-	-	-	-	-	3	-
5	3	3	-	3	-	-	-	-	-	-	-	-	3	-
6	3	3	-	-	-	-	-	-	-	-	-	-	3	-

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II B.Tech. II Semester

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7G349-ANALOG ELECTRONICS LAB

Course Objectives:

- Aims to make the students be able to design electronic circuits
- To understand the analysis of transistor-based amplifiers
- To generate different types of non-sinusoidal signals
- To verify the applications of Op-Amp

Perform the following experiments (minimum 12 of the following)

1. Two stage RC-Coupled amplifier
2. Feedback amplifier (Current Series & Voltage Series)
3. RC Phase shift oscillator
4. Hartley/ Colpitts oscillator
5. Class A power amplifier
6. Class B power amplifier
7. Linear wave shaping
8. Non-linear wave shaping –Clippers
9. Non-linear wave shaping- Clampers
10. Op-Amp applications- adder and subtractor circuits
11. Active filter applications- LPF, HPF (first order)
12. Function generator using Op-Amps
13. IC-555 timer- Monostable and Astable Operation circuit
14. IC 566-VCO Applications
15. 4-Bit DAC using Op-Amp

Course outcomes:

Un completion of the course, students will

1. Have the ability to analyze and design single and multistage amplifiers and feedback amplifiers
2. Design different oscillators with different frequencies
3. Determine the efficiencies of power amplifiers
4. Design wave shaping circuits
5. Able to verify applications of Op-Amp and Timer

Mapping of COs and POs

Course Outcomes	Program Outcomes												Program Specific Outcomes	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**PSO1**	**PSO2**
1	2	3	2	2	2	-	-	2	-	1	-	-	-	-
2	2	3	2	-	-	-	-	2	-	1	-	-	-	-
3	2	1	1	-	2	-	-	-	-	1	-	-	-	-
4	2	3	3	2	2	-	-		2	-	-	-	-	-
5	2	3	2	2	-	-	-	2	-	-	-	-	-	-

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II B.Tech. II Semester	**L**	**T**	**P**
7G245-DC MACHINES LAB	**-**	**-**	**3**

PREREQUISITE(S): DC Machines

Any **TEN** experiments to be conducted from the following

1. Magnetization characteristics of DC shunt generator. (Determination of critical field resistance and Critical speed)
2. Load test on DC shunt generator. (Determination of characteristics)
3. Load test on DC series generator. (Determination of characteristics)
4. Load test on DC compound generator (Cumulative and differential connection). (Determination of characteristics)
5. Hopkinson's test on DC shunt machines. (Predetermination of efficiency)
6. Fields test on DC series machines. (Determination of efficiency)
7. Retardation test on DC shunt motor (Determination of stray losses)
8. Swinburne's tests on DC shunt motor. (Predetermination of efficiencies)
9. Speed control of DC shunt motor by
   a) Armature control method
   b) Field flux control method
10. Brake test on DC compound motor. (Determination of performance curves).
11. Brake test on DC shunt motor. (Determination of performance curves).
12. Separation of losses in DC shunt machine.

Course Outcomes:

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

1. Demonstrate knowledge on
   - Construction and working of various types of DC machines.
   - Starting, braking and speed control of DC motors.
   - Testing of DC machines.
   - Parallel operation of DC generators.
   - Characteristics of DC machines.
2. Analyze the performance of DC machines for various operating conditions.

3. Design the circuit with suitable accessories / controllers for desired operating conditions of DC machines.
4. Interpret and synthesize the data obtained from experimentation on DC machines and provide valid conclusions.
5. Select and apply appropriate technique for testing and control of DC machines used in industry.
6. Apply the conceptual knowledge of DC machines in relevance to industry and society.
7. Commit to ethical principles and standards while exercising the practical investigations on DC machines.
8. Work individually or in a group while exercising practical investigations in the field of DC machines.
9. Communicate effectively in verbal and written form in relevance to DC machines.

Mapping of COs and POs

Course Outcomes	**Program Outcomes**												**Program Specific Outcomes**	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**PSO1**	**PSO2**
1	3	-	-	-	-	-	-	-	-	-	-	-	3	-
2	2	3		-	-	-	-	-	-	-	-	-	3	-
3	1	2	3	-	-	-	-	-	-	-	-	-	3	-
4	2	2	2	3	-	-	-	-	-	-	-	-	-	3
5	1	2	-	-	3	-	-	-	-	-	-	-	-	3
6	1	-	-	-	-	3	-	-	-	-	-	-	-	
7	-	-	-	-	-	-	-	3	-	-	-	-	-	3
8	-	-	-	-	-	-	-	-	3	2	3	-	-	3
9	-	-	-	-	-	-	-	-	2	3	2	-	-	3

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II B.Tech. II Semester

7G247-SIMULATION OF ELECTRICAL & ELECTRONICS LAB

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Any **TEN** experiments to be conducted from the following

1. Simulation of Kirchhoff's laws
2. Simulation of Mesh and Nodal Analysis.
3. Simulation of Reciprocity & Millmann's Theorem.
4. Simulation of Thevenin's & Maximum Power Transfer Theorem.
5. Simulation of Compensation Theorem and Superposition Theorem.
6. Simulation of time constant of series R-C, R-L & RLC circuits.
7. Simulation of DC Circuits
   (a). DC Transfer Function
   (b). DC Sweep Analysis
8. Simulation of two port network parameters.
9. Simulation of two-watt meter method for three phase power measurement.
10. Study of logic gates AND, OR, XOR and NOT using simulation.
11. Measurement of ripple factor of Half Wave Rectifier and Full Wave Rectifier.
12. Simulation of low pass and high pass passive filters.
13. Generation and operation of continuous time signals.
14. Simulation of PN Junction and Zener diode characteristics.
15. Simulation of Input and Output characteristics of Transistor in CE configuration.
16. Simulation of Drain and Transfer Characteristics of JFET.

Mapping of COs and POs

Course Outcomes	PROGRAM OUTCOMES												Program Specific Outcomes	
	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
1	3	3	3	-	3	-	-	-	-	-	3	-	3	-
2	3	3	3	-	3	-	-	-	-	-	3	-	3	-
3	3	3	3	-	3	-	-	-	-	-	3	-	3	-
4	3	3	3	-	3	-	-	-	-	-	3	-	3	-
5	3	3	3	-	3	-	-	-	-	-	3	-	3	-
6	3	3	3	-	3	-	-	-	-	-	3	-	3	-
7	3	3	3	-	3	-	-	-	-	-	3	-	3	-

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II B.Tech. II Semester

7GC44-APTITUDE AND REASONING SKILLS **L T P**

Course Objectives **- - 3**

- To equip students with aptitude and reasoning skills in order to help them succeed in competitive exams.
- To help students improve their knowledge of quantitative and reasoning skills, which in turn helps them comprehend and solve various mathematical problems in professional life.

UNIT I:

Quantitative Aptitude 1: Number Systems- HCF and LCM -Square Roots and Cube Roots-Averages-Problems on ages-Allegations-Percentages-Profit and loss - Mensuration-Area, Volume and Surface Areas- Permutation and Combination-Decimal Fractions-Simplification. (12 contact hours)

UNIT II:

Reasoning 1: Directions-Blood Relations-Problems on Cubes-Series and Sequences- Odd man out- Coding and Decoding. (8 contact hours)

UNIT III:

Quantitative Aptitude 2: Ratio and Proposition and variation-Inequalities - Time and Work-Time and Distance-Pipes and Cisterns -Simple interest and Compound-interest-Calendar-Clocks-True Discount, Banker's Discounts-Data Interpretation, Tabulation, Bar Graphs, Pie charts, Line Graphs (10 contact hours)

UNIT IV:

Reasoning 2: Data Sufficiency-Logical Deductions-Arrangements and Combinations-Groups and Teams-Puzzles. (7 contact hours)

Text Books:

1. R.S. Agarwal, Quantitative Aptitude, S. Chand Publishers, New Delhi, 2005.
2. R.S.Agarwal, Verbal and Non-Verbal Reasoning, S.Chand Publishers, New Delhi, 1998.
3. Shakuntala Devi, Puzzles to Puzzle you, Orient Paper Backs Publishers(OPB), New Delhi, 2005.

References:

1. Arun Sharma, How to Prepare for Quantitative Aptitude, TMH Publishers, New Delhi, 2003.
2. Sharon Weiner-Green, IrnK.Wolf, Barron's GRE, Galgotia Publications, New Delhi, 2006.
3. Shakuntala Devi, More Puzzles, OPB, New Delhi, 2006.
4. Ravi Narula, Brain Teasers, Jaico Publishing House, New Delhi, 2005.
5. George J Summers, Puzzles and Teasers, Jaico Publishing House, Mumbai, 2005

Course Outcomes:

1. The student will be able to apply the knowledge of general mathematical models discussed to solve a variety of problems pertaining to Quantitative functions
2. The Student will be able to read between the lines and understand various mathematical and reasoning concepts, puzzles, charts and interpret their logic

Mapping of COs and POs

Course Outcomes	PROGRAM OUTCOMES												Program Specific Outcomes	
	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2
1	3	-	-	-	-	-	-	-	-	-	-	2		
2	2	-	-	-	-	3	-	-	-	-	-	1		