ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES

RAJAMPET - 516126

(AUTONOMOUS)

www.aitsrajampet.ac.in

DEPARTMENT OF COMPUTER SCIENCE & 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., COMPUTER SCIENCE & 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

To offer advanced subjects in a flexible curriculum which will evolve our graduates to be competent, responding successfully to career opportunities to meet the ongoing needs of the industry. To progress as a Centre of excellence adapting itself to the rapid developments in the field of computer science by performing a high-impact research and teaching environment.

Mission

To impart high quality professional training in postgraduate and undergraduate level with strong emphasis on basic principles of Computer Science and Engineering. To provide our students state-of-the-art academic environment and make unceasing attempts to instill the values that will prepare them for continuous learning. To empower the youth in surrounding rural area with basics of computer education making them self-sufficient individuals. To create teaching-learning environment that emphasizes depth, originality and critical thinking fostering leading-edge research in the ever-changing field of computer science.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The B. Tech., Computer Science & Engineering graduates will be able to:

PEO 1. Technical Competence: to disseminate inclusive knowledge of fundamentals of engineering and modern computing practices, through advanced curriculum, enabling the graduates to synthesize novel ideas.

PEO 2. Learning Environment: to sensitize the graduates with the efficacy of continuous learning reinforced through student-centric pedagogy that inculcates creative talents to survive and thrive in the profession.

PEO 3. Sustainable Skills: to nurture professional behavior and industry-specific acumen in the students to effectively operate and sustain in heterogeneous work environments.

PEO 4. Ethical Behavior: to help the students understand the ramifications of emerging computing technologies and ethical application of technical expertise to resolve contemporary challenges for the welfare of the nation.

PROGRAM OUTCOMES

A graduate of Computer Science & 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.

Index

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 CVV 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 Gender sensitization, 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: similar to theory examination.
		30	**20 Marks** for Day to Day evaluation	Performance in laboratory experiments / Drawing practices
			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 Viva Voce	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 stipulated fee. The photo copy of the answer booklet shall be given to the student on notified date.

6.4.1.1 If the improvement is 15% of maximum marks or more, the new marks will be awarded to the student. Otherwise there will be no change in the old marks

6.4.1.2 If the improvement is 15% of max marks or more 90% of the fee paid will be refunded to the student. If the student's status changes from fail to pass, 50% of fee will be refunded to the student. Otherwise the student will forfeit the amount which he/she paid.

6.4.1.3 No challenge valuation for Laboratory Examination.

6.5 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.

6.6 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.

6.7 Supplementary Examination:

6.4.1 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.

6.4.2 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.

6.8 Internship Programme:

The weightage of two credits 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.

6.9 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 **195/143 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 required 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
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Regulations: **R17** Programme Code: **G1**

I Year B. Tech., I Semester

Subject Code	Subject Name	Hours / Week			C
		L	T	P	
7GC11	Technical English and Professional Communication	4	1	0	4
7GC12	Engineering Chemistry	3	1	0	3
7GC14	Engineering Mathematics-I	4	1	0	4
7G111	Problem solving techniques and C Programming	4	1	0	4
7G513	Basic Engineering Drawing	1	0	3	3
7GC18	Engineering Chemistry and Engineering Workshop Lab	0	0	3	2
7G112	Programming in C Lab	0	0	3	2
7GC17	English Language Communication Skills Lab	0	0	4	2
7G113	IT Workshop	0	0	3	2
		16	**4**	**16**	**26**

I Year B. Tech., II Semester

Subject Code	Subject Name	Hours / Week			C
		L	T	P	
7GC21	Environmental Science	3	1	0	3
7GC23	Engineering Physics	3	1	0	3
7GC24	Engineering Mathematics-II	4	1	0	4
7G121	Data Structures	4	1	0	4
7G221	Basic Electrical and Electronics Engineering	4	1	0	4
7GC26	Engineering Physics Lab	0	0	3	2
7G222	Basic Electrical and Electronics Engineering Lab	0	0	3	2
7G122	Data structures Lab	0	0	6	4
AUDIT COURSE	Gender Sensitization	2	0	0	0
	Total	**20**	**5**	**12**	**26**

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

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Regulations: **R17** Programme Code: **G1**

II Year B. Tech., I Semester

Subject Code	Subject Name	Hours / Week			C
		L	T	P	
7GC32	Engineering Mathematics-III	3	1	0	3
7GC33	Aptitude and Reasoning Skills	0	2	0	1
7G131	Advanced Data Structures Through C++	3	1	0	3
7G132	Database Management Systems	3	1	0	3
7G133	Digital Logic Design	3	1	0	3
7G134	Discrete Mathematics	3	1	0	3
7G135	Web Programming	3	1	0	3
7G136	Advanced Data Structures Lab Through C++	0	0	3	2
7G137	Database Management Systems Lab	0	0	3	2
7G138	Web Programming Lab	0	0	3	2
	Sports and Extension Activities	0	0	1	0
	Total	**18**	**8**	**10**	**25**

II Year B. Tech., II Semester

Subject Code	Subject Name	Hours / Week			C
		L	T	P	
7GC42	Probability and Statistics	3	1	0	3
7G141	Computer Organization	3	1	0	3
7G142	Design and Analysis of Algorithms	3	1	0	3
7G143	Formal Languages and Automata Theory	3	1	0	3
7G144	Object Oriented Programming Using Java	3	1	0	3
7G145	Operating Systems	3	1	0	3
7G146	Seminar-1	0	0	2	1
7G147	DAA Lab	0	0	3	2
7G148	JAVA Lab	0	0	3	2
7G149	Operating Systems Lab	0	0	3	2
Total		**18**	**6**	**11**	**25**

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

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

(7GC11) TECHNICAL ENGLISH AND 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

Text Books:

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 & Meera Banerji , Macmillan, 2009
2. Essential Grammar in Use, (with CD), Raymond Murphy, 3/e, Cambridge University Press, 2009
3. English Grammar and Composition, David Grene, Mc Millan 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, Aysha Viswamohan, 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. Students will learn to effectively utilize his body language to communicate in his academic and professional career.

Course Outcomes(CO) & Program Outcomes(PO) Mapping:

	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

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

(7GC12) ENGINEERING CHEMISTRY
(Common to CSE, ME and CE)

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 Reductional 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. weak 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 & Electrolessplating-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, Nylons-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 Gasand 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. 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, DhanapathRai 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. SeshaMaheswaramma and MrudulaChugh, Pearson Education, First Edition, 2013

Course Outcomes:

1. The students will be able to understand the basic concepts of water analysis methods which helps 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

Course Outcomes & Program Outcomes Mapping:

	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	-	-	-	-	-	-	-	-	-	-	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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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 & 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.

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.

Course Outcomes & Program Outcomes Mapping:

	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

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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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 programs 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.

Course Outcomes & Program Outcomes Mapping:

	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

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

I Year B. Tech., I Semester

(7G513) BASIC ENGINEERING DRAWING

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 to Engineering Drawing - Lettering, Geometrical Constructions.

Conics– Construction of Ellipse, Parabola and Hyperbola (General method only). Construction of Ellipse using special methods like Concentric Circles method, Oblong method & Arcs of Circles method only.

UNIT II

Projections of points, Projections of lines - Inclined to one planes and inclined to both the planes (Elementary treatment)

UNIT III

Projections of Planes –Inclined to one planes and inclined to both the planes. (Elementary treatment)

UNIT IV

Projections of solids:

Cylinder, Cone, Prism and Pyramid - Axis Inclined to one plane and inclined to both the planes

UNIT V

Isometric projections of Lines, Planes and Simple Solids.

Conversion of Orthographic views into Isometric views & Isometric views to Orthographic views.

TEXT BOOKS :

1. Engineering drawings by N.D.Bhatt

2 Engineering graphics by K.L. Narayana & P.Kannayya

REFERENCES:-

1. Engineering drawing and graphics by Venugopal/ New age

2. Engineering drawing by Johle / TMI

Course Outcomes:

1. Students will be able to know and understand the conventions and the methods of Engineering Drawing with proper dimensions and annotations for two-dimensional Engineering drawings.
2. Able to understand the application of industry standards and techniques applied in Engineering 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.

Course Outcomes & Program Outcomes Mapping:

Course Outcomes		Pos										
	1	2	3	4	5	6	7	8	9	10	11	12
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		

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

I Year B. Tech., I Semester

(7GC18) ENGINEERING CHEMISTRY AND ENGINEERING WORKSHOP LAB

ENGINEERING CHEMISTRY LAB

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 6 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

INSTRUMENTATION

Colorimetry

7. Estimation of Iron in Cement by Colorimetry.

Conductometry

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

Fuel analysis

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

Lubricants

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

PREPARATION OF POLYMERS

14. Preparation of Bakelite
15. 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.ChandraSekhar, 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.

Course Outcomes & Program Outcomes Mapping:

	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	-	-	-	-	-	-

ENGINEERING WORKSHOP LAB

This syllabus is a part of above course.

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:**
    a. **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
    b. **Sheet metal shop**– Two jobs (exercises) from: Tray, cylinder, hopper or funnel from out of 22 or 20 gauge G.I. sheet.
    c. **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.

Course Outcomes & Program Outcomes Mapping:

CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3											3
2	1								2			3

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

I Year B. Tech., I Semester

(7G112)PROGRAMMING IN C LAB

(Common to all branches)

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:

After Completion of the course student should able to

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

Course Outcomes & Program Outcomes Mapping:

Course outcomes	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

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

(7GC17) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

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. 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.

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	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

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

(7G113) I.T WORKSHOP

Course Objectives:

1. To provide Technical training to the students on Productivity tools like Word processors, Spreadsheets, Presentations
2. 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
3. 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: Spread sheet: 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, hyperlinking, 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.

1. Desktop computer
2. Server computer
3. Switch (computer science related)
4. Microprocessor kit
5. Micro controller kit
6. Lathe machine
7. Generators
8. Construction material
9. Air conditioner
10. UPS and Inverter
11. RO system
12. Electrical Rectifier
13. CRO
14. Function Generator
15. 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.

1. Desktop operating system
2. Server operating system
3. Antivirus software
4. MATLAB
5. CAD/CAM software
6. AUTOCAD

REFERENCE BOOKSS:

1. Introduction to Computers, Peter Norton, Mc Graw Hill
2. MOS study guide for word, Excel, Powerpoint & 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", Bigelows, 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

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	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			

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

I Year B. Tech., II Semester

(7GC21) ENVIRONMENTAL SCIENCE

Course Objectives:

1. To enable student to know about the importance of environment.
2. To train the student to use different methods to conserve natural resources.
3. To enable the student to learn about the concept of ecosystem and biodiversity and its conservation.
4. To make student to study about different types of pollutions.
5. To enable the student to understand the social issues and human population issues related to environment.

UNIT I

Introduction to Environment: Definition, Multidisciplinary nature of environmental studies, Scope & Importance of environmental studies, Need for public awareness, People in environment, Institutions in environment.

UNIT II

Renewable & Non-renewable natural resources: Forest resources: Use, deforestation, dams & their effects on forest & tribal people.

Water resources: Use, Water cycle, floods, drought, conflicts over water.

Mineral resources: Use, environmental effects of extracting mineral resources.

Food resources: Impacts of over grazing, traditional agriculture and modern agriculture

Energy resources: Renewable and non – renewable energy resources, use of alternate energy resources

Land resources: Land degradation, soil erosion, Role of an individual in the conservation of natural resources.

UNIT III

Ecosystems: Producers, consumers & decomposers, Food chains, food webs & ecological pyramids, Biogeochemical cycles-Oxygen cycle, Carbon cycle and Nitrogen cycle.

Types, characteristic features, structure and function of the following ecosystems:(a)Forest ecosystems (b) Grass land ecosystems (c) Desert ecosystems (d) Aquatic ecosystems(lakes, rivers, oceans, estuaries)

Biodiversity and Its Conservation: Definition, Values of biodiversity: consumptive value, productive value, social value, ethical value, aesthetic value & option value, Hot spots of biodiversity, Threats to biodiversity: habitat loss, poaching ofwild life, Conservation of biodiversity: In-situ & Ex-situ conservation

UNIT IV

Environmental Pollution: Definition, causes, effects & control measures of: Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution, Marine pollution, Nuclear hazards.

UNIT V

Issues and the Environment: Rain water harvesting, Environmental ethics: Issues & possible solutions, Global warming, Acid rain, Ozone layer depletion, Environment protection Act, Air (Prevention & Control of Pollution) Act, Water (Prevention & Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act.

Human Population and the Environment: Population explosion, Family Welfare Program, Environment & human health - Human Rights (in relation to environment) - Value Education (environmental values), HIV/AIDS, Field work-Visit to a local area to document environmental assets.

Text Books:

1. Text book of Environmental Studies for Undergraduate Courses by ErachBharucha,University Grants Commission, University press, New Delhi, 2004.
2. Perspectives in Environmental Studies, AnubhaKaushik and C.P.kaushik, Fifthedition, New Age International Publishers, 2016.

Reference Books:

1. Environmental Studies, Benny Joseph, Second edition, McGrawHill Education (India) Private Limited, 2013.
2. Environmental Studies from Crisis to Cure, R. Rajagopalan, Oxford University Press, 2015.
3. Environmental studies:A Text Book for Undergraduates, Dr.K. Mukkanti, S.Chand and Company Ltd, 2010.
4. Ecology, Environmental Science and Conservation, J.S. Singh, S.P. Singh and S.R. Gupta, S.Chand and Company Ltd, 2014.
5. A textbook of Environmental Studies, Shashi Chawla, Tata McGraw Hill Education India, 2012.

Course Outcomes:

1. The student will understand the importance of environment.
2. The student develops critical thinking to conserve natural resources.
3. The student will understand the concept of ecosystem and biodiversity and its conservation.
4. The student knows about different types of pollutions, their sources, effects and control measures.

5. The student will apply the knowledge to solve the social issues and human population issues related to environment.

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
CO1	1	1	-	-	-	1	3	-	-	-	-	3
CO2	1	1	-	-	-	3	3	-	-	-	-	3
CO3	1	1	-	-	-	-	3	-	-	-	-	3
CO4	2	2	-	-	-	3	3	-	-	-	-	3
CO5	3	3	-	-	-	3	3	-	-	-	-	3

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

(7GC23) ENGINEERING PHYSICS
(Common to CSE, ME and CE)

Course Objectives:

1. 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.
2. The Engineering Physics course educates the principles of optical science and Engineering necessary to understand optical systems.
3. The crystallography, X-ray diffraction of crystals explain how basic structure modulates properties of materials.
4. The principles of Quantum mechanics and Electron theory of metals give an idea on basic development of energy in metals.
5. 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 –Fraunhoferdiffraction 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.

Fibre optics: Introduction– Construction and working principle of optical fiber –Numericalaperture 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'suncertainty 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 AND SUPERCONDUCTORS:

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

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 nanomaterials.

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	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

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

(7GC24) ENGINEERING MATHEMATICS – II

(Common to all branches)

Course Objectives:

1. To apply this knowledge to evaluate the Multiple Integrals in real life situations.
2. To introduce the concepts of Laplace transforms.
3. To apply the knowledge of Inverse Laplace transforms for engineering problems.
4. To provide the concepts of vector differentiation and integration.
5. 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 GroupLondon, 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.

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	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

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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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
- Implementation of C programs using Structures, Unions, Files and Pointers.
- Implementation of various types of searching and sorting techniques.
- Implementation of linear Data structures.
- Implementation of non-linear Data structures.

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 DataStructures.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. 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, YeswanthKanitkar, 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.

Course Outcomes & Program Outcomes Mapping:

Course outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	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

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

I Year B. Tech., II Semester

(7G221)BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Course Objectives:

- To impart the basic knowledge about the Electric circuits.
- To understand the working of various Electrical Machines.
- To know about various electronic devices.
- To understand the various parts of CRO.

UNIT I

ELECTRICAL CIRCUITS: Basic definitions, types of elements, ohm's law, resistive, inductive, capacitive networks, Series- parallel circuits, star and delta transformations, and Kirchhoff's laws.

UNIT II

DC MACHINES: DC Generator: Constructional Details of DC machine, Principle of operation, emf equation, types of generators, applications.

DC Motor: principle of operation, torque equation, types, three point starter, losses and efficiency, applications

Testing: brake test, Swinburne's test, and Speed control methods.

UNIT III

AC MACHINES: 1-φTransformers: Principle of operation, emf equation, losses, efficiency and regulation. OC and SC tests.

Alternator: Principle of operation of alternators-Regulation by synchronous impedance method.

3-φ Induction motor: Principle of operation of induction motor-slip-torque characteristics.

Test: Brake Test on 3- φ induction motor.

UNIT IV

DIODE AND TRANSISTORS: Diode: PN junction diode, symbol, V-I characteristics, applications, Half wave, full wave and bridge rectifiers (simple problems).

Transistors: PNP and NPN junction transistors, Characteristics of CE configuration, Transistor as an amplifier, single stage CE amplifier, Frequency response of CE amplifier

UNIT V

ELECTRIC HEATING AND CRO: Induction Heating: Theory of induction heating, applications in industries.

Dielectric heating: Theory of dielectric heating and its industrial application

CRO: Block diagram of CRO, Principle of CRT (cathode ray tube), applications of CRO, voltage, current and frequency measurements.

Text Books:

1. V.K.Mehta, *Principles of Electrical and Electronics Engineering*. S.Chand & Co.
2. T.Thyagarajan, *Fundamentals of Electrical and Electronics Engineering*. SciTech publications, 2007, 5th Ed.

Reference Books:

1. M.S Naidu and S.Kamakshaiah, *Introduction to Electrical Engineering.* TMH Publications.
2. Kothari and Nagrath, *Basic Electrical Engineering*, TMH, 2nd Ed.
3. Mill man and Halkias, *Electriconics devices and circuits*.

Course Outcome:

After the completion of the course, the student should be able

1. Able to apply fundamental concepts to find response of electrical circuits.
2. Able to identify the types of DC-Machines and their applications
3. Able to calculate the efficiency of DC-Machines.
4. Able to explain the principle operation of Transformer, Induction Motor and their application.
5. Able to draw the slip-Torque characteristics of Induction motor.
6. Able to identify the semi-conductor devices and their applications.
7. Able to explain the types of heating
8. Able to explain the working principle of CRO.

Mapping of CO's Vs PO's

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

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

I Year B. Tech., II Semester

(7GC26) ENGINEERING PHYSICS LAB

(Common to CSE, ME and CE)

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

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	2	-	-	-	2	-	-	-	-	-	-	-
CO2	3	2	-	-	3	-	-	-	-	-	-	-
CO3	2	2	-	2	3	-	-	-	-	-	-	-
CO4	2	3	-	-	2	-	-	-	-	-	-	-

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

I Year B. Tech., II Semester

(7G222)BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB

Course Objectives:

- To understand the concepts of efficiency of a DC Machine under no-load & loading conditions.
- To understand the various speed control methods of DC Machine.
- To Understand the Operation of Diode and Transistor.
- To understand the operation of CRO.

Any **ten** Experiments to be conducted.

Electrical Engineering Lab

1. Swinburne's test on D.C shunt machine (pre determination of efficiency of a given D.C shunt machine working as generator and motor).
2. OC and SC tests on single phase transformer (pre determination of efficiency and regulation at a given power factors).
3. Brake test on three phase induction motor (determination of performance characteristics).
4. Regulation of alternator by synchronous impedance method.
5. Speed control of D.C shunt motor by
   (a) Armature control method (b) field flux control method.
6. Brake test on D.C shunt motor (determination of performance characteristics).

Electronics Engineering Lab

1. Study of CRO (Measurement of voltage frequency and phase of periodic signals).
2. V-I Characteristics of PN junction diode.
3. Full wave rectifier with and without capacitive filter.
4. Input and output characteristics of Common Emitter (CE) Configuration.
5. Frequency response of a single stage CE amplifier.
6. Sinusoidal signal generation using RC phase shift oscillator circuit.

Course Outcomes:

1. Ability to conduct testing and experimental procedure on DC Machines.
2. Ability to find the performance Characteristics of three Phase induction motor.
3. Ability to test the single phase transformer to know the performance.
4. The capability to analyze the operation characteristics of electrical machines under different loading conditions.
5. Ability to plot the VI characteristics of Diode and Transistor.
6. Ability to measure various parameters(Frequency, Peak-Peak Voltage, Time period) of signals using CRO.

Mapping of CO's Vs PO's

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

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

I Year B. Tech., II Semester

(7G122) DATA STRUCTURES LAB

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 4 Programs on pointer basics.

Exercise 2 : Minimum of 4 Programs on Pointers applications.

Exercise 3 : Minimum of 4 programs on structures and unions

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

Exercise 5 : Minimum of 4 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.

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	Programme Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO -1	3	3	2	2	-	-	1	-	1	-	-	2
CO-2	3	2	2	2	-	-	-	-	-	2	-	3
CO-3	2	2	2	2	-	-	-	-	2	2	-	3

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

I Year B. Tech., II Semester

GENDER SENSITIZATION

(Audit Course)

Course Objectives:

- To develop students' sensibility with regard to issues of gender in contemporary India.
- To provide a critical 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: Makin Women, Making Men (Towards a world ofEquals: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 Kom and 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 Unaccounted work

UNIT IV

ISSUES OF VIOLENCE:

Sexual Harassment: Say No!(Towards a World of Equals: Unit-6) Sexual Harassment, not Eve-teasing-Coping with Everyday 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 for my Life…..".

UNIT V

GENDER STUDIES:

Knowledge: Through the Lens of Gender (Towards a World ofEquals-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.

Text Book:

"Towards a world of equals: A Bilingual Textbook on gender", A. Suneeta, Uma Bhrugubanda, DuggiralaVasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, GoguShyamala, 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. "Morethan oneMillion Women areMissing." New York ReviewofBooks 37.20(20 December1990).print "
2. TripiLahiri, BytheNumbers: 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 AreSprouting: NewDalit Writing From SouthIndia,Dossier 2:Telugu and Kannada
4. Vimala. "vantillu (the kitchen)". Women writingin India: 600 BC to thepresent volumeII; The20thcentury. Ed. SusieTharuand K.Lalita. Delhi: Oxford universitypress, 1995, 599-601.
5. Shatrughna, veena etal. women's workand its impact on child health and nutrition, Hyderabad, national instituteof nutrition,Indian council of medical research. 1993.
6. Gautam,LielaandGita Ramaswamy. "A'Conversation' between aDaughter and aMother". Broadsheet on contemporaryPolitics, special issueon sexualityand harassment; Gender politics on campus today, Ed. Madhumeeta Sinha and Asma Rasheed. Hyderabad: AnveshiResearch center forwomen's Studies, 2014.

7. Abdulali Sohaila. “Ifought for mylife….and won”. Available onlineat:http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/
8. VirginiaWoolf. ARoom of one’s own. Oxford; Black swan. 1992.

Course Outcomes:

1. Students will have developed a better understanding of important issues related to gender in contemporary India.
2. 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.
3. Students will attain a clear grasp of how gender discrimination works in our society and how to counterit.
4. Students will acquire insight into the gendered division of labour and its relation to politics and economics.
5. Men and women students and professionals will be better equipped to work and live together as equals.
6. Students will develop a sense of appreciation of women in all walks of life.
7. 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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(AN AUTONOMOUS INSTITUTION)

II B. Tech., I Semester **L T P**
3 1 0

7GC32-Engineering Mathematics-III
(Common to All branches)

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:

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

Reference Books:

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**											
	1	2	3	4	5	6	7	8	9	10	11	12
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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(AN AUTONOMOUS INSTITUTION)

II B. Tech I Semester **L T P**
0 2 0

7GC33-Aptitude and Reasoning Skills
(Common to CE and CSE)

Course Objectives:

- 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.

Reference Books:

1. Arun Sharma, How to Prepare for Quantitative Aptitude, TMH Publishers, New Delhi, 2003.
2. Sharon Weiner-Green, Irn K.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											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1	3	-	-	-	-	-	-	-	-	-	-	2
2	2	-	-	-	-	3	-	-	-	-	-	1

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II B. Tech I Semester **L T P**
3 1 0

7G131-Advanced Data Structures Through C++

Course Objectives:

The Primary Objectives of This Course are as Follows:

- To understand the basic concepts of C++ Programming Language
- To learn the Object Oriented concepts of C++ and analyzing the performance of an Algorithms
- To learn New & Advanced Data Structures using Generic Programming
- To acquire knowledge on Nonlinear Data Structures (Trees)
- To learn how to construct trees on patterns

UNIT I

INTRODUCTION TO C++: Introduction, **Class Overview:** Class, Objects, Class Members, I/O Streams, Access Control, Class Scope, **Static Class Members**: Static Member Variables, Static Member Functions, Static Object, **Functions:** Parameter Passing Methods, Inline Functions, The Friend Function, This Pointer, **Dynamic Memory Allocation and De-allocation:** New Operator, Delete Operator, Exception Handling.

UNIT II

OBJECT ORIENTED CONCEPTS: Constructors, Constructor Overloading, Destructors, Function Overloading. **Operator Overloading**: Plus, Minus, Unary, Inheritance: Base Class Access Control, Types of Inheritances, Reasons for the usage of Inheritance, Polymorphism: Virtual Functions, Pure Virtual Functions, Abstract Classes, Generic Programming with Templates: Function Templates, Class Templates.

Algorithms: Performance Analysis, Space Complexity, Time Complexity: Bubble Sort, Selection Sort.

UNIT III

STACKS AND QUEUES: Stack ADT, Queue ADT, Operations of Stack & Queue ADT

DICTIONARIES: Dictionaries, Linear List Representation, Skip List Representation: Operations, Searching, Insertion, Deletion, Hash Table: Hash Functions, Collisions: Separate Chaining, Open Addressing - Linear Probing, Quadratic Probing, Double Hashing or Rehashing, Extendible Hashing, Comparison of Chaining and Open Addressing.

UNIT IV

BINARY TREES: Binary Trees, Representation of Binary Trees, Binary Trees Operations, Binary Trees Traversals.

PRIORITY QUEUES: Priority Queue ADT, Priority Queue Implementation Using Heaps, External Sorting.

SEARCH TREES (PART I): Binary Search Trees ADT, Representation of Binary Search Tree, Operations on Binary Search Trees: Insertion, Deletion and Searching, AVL Trees, Operations of AVL Trees: Insertion, Deletion and Searching.

UNIT V

SEARCH TREES (PART II): Introduction to Red–Black and Splay Trees, B-Trees, Operations on B-Trees: Insertion, Deletion and Searching, Height of B-Tree.

PATTERN MATCHING AND TRIES: Pattern Matching Algorithms, Fixed Pattern Matching Algorithms: Brute Force, Boyer–Moore, Knuth-Morris-Pratt Algorithms, Tries: Standard Tries, Compressed Tries, Suffix Tries.

Text Books:

1. AkepoguAnanda Rao, PalagiriRadhikaRaju, Data Structures and Algorithms Using C++, Pearson Education.
2. SartajSahni Data Structures, Algorithms and Applications in C++, Universities Press (India) Pvt. Ltd, 2nd Edition.
3. Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education, 2nd Edition.

Reference Books:

1. Data Structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and Mount, Wiley Student Edition, John Wiley And Sons.
2. Data Structures and Algorithms in C++, 3rd Edition, Adam Drozdek, Thomson
3. Data Structures Using C and C++, Langsam, Augenstein and Tanenbaum, Phi.
4. Problem Solving With C++, The OOP, 4th Edition, W.Savitch, Pearson Education.

Course Outcomes:

After the completion of this course, the student will be:

1. Able to understand the basic concepts of C++ and its functions
2. Able to understand and apply the Object Oriented Concepts and performance analysis for algorithms
3. Able to apply and analyze the abstract data types such as Stacks, Queues, and Dictionaries
4. Able to categorize tree data structures such as binary search trees, AVL, Red-black, Splay trees
5. Able to determine pattern matching algorithm efficiencies.

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	-	-	-	-	-	-	-	-	2
2	3	3	3	-	-	-	-	-	-	-	-	-
3	3	3	3	-	3	-	-	-	1	-	-	2
4	3	3	-	-	-	-	-	-	-	-	-	-
5	3	3	3	-	3	-	-	-	-	-	-	-

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II B. Tech I Semester **L T P**
3 1 0

7G132-DATABASE MANAGEMENT SYSTEMS

Course Objectives:

- To understand the role and uses of DBMS in an organization.
- To understand fundamental concepts of Database Management Systems like database design, database languages, and database-system implementation.
- To construct simple and moderately advanced database queries using Structured Query Language (SQL).
- Understand and successfully apply logical database design principles, including E-R diagrams and database normalization techniques.
- To provide detailed knowledge of transaction, concurrency and recovery strategies of DBMS.

UNIT I

INTRODUCTION: Database-System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Data Storage and Querying, Transaction Management, Data Base Architecture, Database Users and Administrators, History of Database Systems.

UNIT II

DATABASE DESIGN: Database Design and ER Diagrams, Entities, Attributes and Entity Sets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design with the ER Model, Case study: The Internet Shop.

THE RELATIONAL MODEL: Introduction to the Relational Model, Integrity Constraints over Relations, Enforcing Integrity Constraints, Querying Relational Data, Logical Data Base Design: ER to Relational.

UNIT III

SQL AND PL/SQL: Introduction to SQL, Data Definition Commands, Data Manipulation Commands, Select Queries, Virtual Tables: Creating View, Altering View, Updating View, Destroying View, Relational Set Operators, SQL Join Operators, Sub Queries and Correlated Queries, Aggregate Functions, Procedural SQL: Stored Procedures, Stored Functions, Triggers, Cursors.

UNIT IV

SCHEMA REFINEMENT AND NORMAL FORMS: Introduction to Schema Refinement: Problems Caused by Redundancy, Decompositions, Problems Related to Decomposition, Functional Dependencies, Reasoning about FDs, Normal Forms: 1NF, 2NF, 3NF, BCNF, Properties of Decomposition: Lossless Join Decomposition, Dependency Preserving Decomposition, Multivalued Dependencies, 4 NF.

UNIT V

OVERVIEW OF TRANSACTIONS MANAGEMENT: ACID Properties: Consistency and Isolation, Atomicity and Durability, Transactions and Schedules, Concurrent Execution of Transactions, Lock-Based Concurrency Control, Performance of Locking, Transaction Support in SQL.

TREE-STRUCTURED INDEXING: Intuition for Tree Indexes, Indexed Sequential Access Methods (ISAM), B^+ Trees: A Dynamic Index Structure.

Text Books:

1. Silberschatz, Korth, Sudarshan, Database System Concepts. McGraw Hill, 5^{th} Edition.
2. RaghuRamaKrishnan, Johannes Gehrke, Database Management Systems, McGraw Hill, Third Edition.
3. Peter Rob, A. Ananda Rao, Carlos Coronel, Database Management Systems, CENGAGE Learning.

Reference Books:

1. Elmasri,Navate, Fundamentals of Database Systems. Pearson Education.
2. C.J.Date, Introduction to Database Systems. Pearson Education.

Course Outcomes:

1. Able to understand the basic concepts and applications of database systems.
2. Able to Define an Entity-Relationship (E-R) model from specifications and to perform the transformation of the conceptual model into corresponding logical data structures.
3. Able to implement database schemas in structurequery languages.
4. Able to Identify and eliminate redundancies in a database schema using normalization.
5. Able to Analyze transaction management concepts in databases and the need of concurrency control.

Mapping of COs and POs:

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

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(AN AUTONOMOUS INSTITUTION)

II B.Tech I Semester **L T P**
3 1 0

7G133-DIGITAL LOGIC DESIGN

Course Objectives:

- To understand how data representation and binary logic is defined for digital systems.
- To understand minimization of Boolean functions and expressions.
- To understand how logic circuits are analyzed and designed in combinational logic
- To understand how logic circuits are analyzed and designed in sequential logic
- To understand different counters, memory and programmable logic devices.

UNIT I

Introduction to Binary System and Codes: Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements. Signed Binary Numbers, Binary Codes, Binary Logic.

Boolean algebra and Logic Gates: Basic Definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations.

UNIT II

Gate-Level Minimization: Digital Logic Gates, Integrated Circuits, The Map Method, Four-Variable Map, Five-Variable Map, Product of Sums Simplification, Don't-Care Conditions, NAND and NOR Implementation, Exclusive-OR Function.

UNIT III

Combinational Logic: Combinational Circuits, Analysis Procedure of Combinational Circuits, Design Procedure, Binary Adder, Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

UNIT IV

Synchronous Sequential Logic: Sequential circuits, Latches, Flip-Flops, Analysis of clocked sequential circuits, state reduction and Assignment, Design Procedure.

Registers: Registers, Shift Registers.

UNIT V

Counters: Ripple Counters, Synchronous Counters, Other Counters. Introduction to Asynchronous Sequential Logic.

Memory and Programmable Logic: Introduction, Random-Access Memory, Error Detection and Correction, Read-Only Memory, Programmable Logic Array, Programmable Array Logic, Sequential Programmable Devices.

Text Book:

1. Digital Design, 4^{th} Edition, M. Morris Mano, Pearson Education,Inc.,2002

Reference Books:

1. Digital Logic Design Principles, Norman Balabanianand Bradley Carlson, John Wiley & Sons(Asia) Pte.Ltd.,2002..
2. Fundamentals of Digital Circuits, A. Ananda Kumar, PHI, 2002.

Course Outcomes:

1. Able to understand different number systems, binary arithmetic, and different switching algebra theorems to derive logic functions
2. Able to understand the Karnaugh map representation and perform operations on it.
3. Able to analyze and design of different combinational circuits.
4. Able to understand the synchronous sequential circuits.
5. Able to understand counters, memory and programmable logic devices.

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	-	-	-	-	-	-	-	-
2	3	3	3	3	-	-	-	-	-	-	-	-
3	3	3	3	3	2	-	-	-	-	-	-	3
4	3	3	3	3	-	-	-	-	-	-	-	3
5	3	3	3	3	2	-	-	-	-	-	-	3

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(AN AUTONOMOUS INSTITUTION)

II B. Tech I Semester **L T P**
3 1 0

7G134-DISCRETE MATHEMATICS

Course Objectives:

- Simplify and evaluate basic logic statements and Express a logic sentence in terms of predicates, quantifiers, and logical connectives.
- Solve problems using operations of sets and functions.
- Understand algebraic structures and solve counting problems by applying elementary counting technique.
- Solve problems using recurrence relations and recursion to analyze algorithms.
- Students will learn core ideas in graph theory.

UNIT I

MATHEMATICAL LOGIC: Statements and Notation, Connectives, Statement Formulas and Truth Tables, Conditional and Bi-conditional, Well-Formed Formulas, Tautologies, Equivalence of Formulas, Duality Law, Tautological Implications, Normal Forms, Validity using Truth Tables, Rules of Inference, Consistency of Premises and Indirect Method of Proof, Automatic Theorem Proving, Predicates, The Statement Function, Variables and Quantifiers, Predicate Formulas, Free and Bound Variables, The Universe of Discourse.

UNIT II

RELATIONS AND FUNCTIONS: Properties of binary Relations in a Set, Relation Matrix and the Graph of a Relation, Partition and Covering of a Set, Equivalence Relations, Compatibility Relations, Partial Ordering, Hasse Diagram. Functions, Composition of Functions, Inverse Functions, Recursive Functions, Lattice and its Properties.

UNIT III

ALGEBRAIC STRUCTURES: Algebraic Systems, Simple Algebraic Systems and General Properties, Semi Groups and Monoids, Groups, Subgroups, Homomorphism, Isomorphism

ELEMENTARY COMBINATORICS: Basics of Counting, Combinations and Permutations, Binomial Coefficients, The Binomial and Multinomial Theorems, The Principle of Inclusion- Exclusion, Pigeonhole Principle and its Applications.

UNIT IV

RECURRENCERELATIONS: Generating Functions of Sequences, Calculating Coefficients of Generating Functions, Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, The Method of Characteristic Roots, Solutions of Inhomogeneous Recurrence Relations.

UNIT V

GRAPH THEORY: Basic Concepts, Representation of Graphs, Isomorphism and Subgraphs, Depth First Search, Breadth First Search, Trees and Their Properties, Spanning Trees, Binary Trees, Planar Graphs, Euler's Formula, Multigraphs and Euler circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

Text Books:

1. J.P.Tremblay, R.Manohar, Discrete Mathematical Structures with Applications to Computer Science. TMH (UNITS 1 & 2).
2. J.L.Mott,A.Kandel, T.P.Baker,Discrete Mathematics for Computer Scientists &Mathematicians. Prentice Hall (UNITS 3,4 & 5)

Reference Books:

1. Thomas Koshy, Discrete Mathematics with Applications. Elsevier.
2. N. Chandrasekaran, M. Umaparvathi, Discrete Mathematics,PHI Learning Pvt. Ltd.
3. BernandKolman, Roberty C. Busby, Sharn Cutter Ross, Discrete Mathematical Structures. Pearson Education/PHI.
4. Malik &Sen, Discrete Mathematical Structures Theory and application.
5. Garry Haggard and others, Discrete Mathematics for Computer science, Thomson.

Course Outcomes:

Upon successful completion of this course students will be:

1. Able to understand and apply the logic statements and express logic sentences in terms of predicates, quantifiers and logical connectives.
2. Able to demonstrate the relations, functions and determine their properties.
3. Able to understand the basic concepts of algebraic structures and analyze permutations, combinations, Pigeon hole principle and its applications.
4. Able to understand the various types of recurrence relations and apply the methods to find out their solutions.
5. Able to manipulate and analyze data numerically and/or graphically.

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							1		3
2	3	3	3	3								3
3	3	3	3									3
4	3	3	3	3								3
5	3	3	3	3		1	1					3

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(AN AUTONOMOUS INSTITUTION)

II B. Tech I Semester **L T P**
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7G135-WEB PROGRAMMING

Course Objectives:

This course make the students

- Understand and apply the HTML concepts in developing the web pages
- Apply the CSS to the web pages.
- Understand the JavaScript programming language
- Understand the JavaScript framework JQuery

UNIT I

Structuring Documents for the Web-A Web of Structured Documents, Introducing HTML5, Tags and Elements, Attribute Groups Core Attributes, Internationalization, Core Elements ,Basic Text Formatting,Understanding Block and Inline Elements, Grouping Content, Working with Lists, Text Processing tags, **Links and Navigation :**Basic Links,Understanding Directories and Directory Structures, Understanding URLs, Creating In-Page Links with the <a> Element

UNIT II

Images, Audio, and Video -Adding Images Using the <img> Element, Using Images as Links Adding Flash, Video, and Audio to Your Web Pages **Tables:** Introducing Tables, Basic Table Elements and Attributes, Adding a Caption to a Table, Grouping Sections of a Table, Nested Tables, Accessible Tables. **Forms:** Introducing Forms, Creating a Form with the <form> Element, Form Controls, Creating Labels for Controls and the <label> Element, Structuring Your Forms with <fieldset> and <legend> Elements, Focus, Disabled and Read-Only Controls, Sending Form Data to the Server, Creating More Usable Form Fields.

UNIT III

Cascading Style Sheets: Introducing CSS, Where You Can Add CSS Rules, CSS Properties Controlling Text, Text Formatting, Text Pseudo-Classes, Styling Text, Selectors Lengths, Introducing the Box Model, An Example Illustrating the Box Model, Links, Backgrounds, Lists, Tables, Miscellaneous Properties.

Introduction to XML: Difference between HTML and XML, Basic structure and Syntax of XML Document, DTD, sample examples.

UNIT IV

Learning JavaScript-Introduction to JavaScript, How to Add a Script to Your Pages, comments in JavaScript, Create an External JavaScript ,The Document Object Model, JavaScript Programming console, General Programming Concepts, Variables, Operators, String Operators (Using + with Strings), Functions, Conditional Statements, Looping, Events, Built-in Objects, Writing JavaScript, A-Word about Data Types.

UNIT V

Working with jQuery: introduction to jQuery, adding jQuery to Your Page, jQuery Basics, jQuery and the DOM, Managing Events with jQuery, Ajax with jQuery, jQuery UI.

Text Books:

1. Beginning HTML and CSS Rob Larsen, Wrox Programmer to Programmer

Reference Books:

1. JavaScript and JQuery: Interactive Front-End Web Development,Jon Duckett, Wiley Publications
2. Web Design with HTML, CSS, JavaScript and jQuery Set, Jon Duckett, Wiley Publications
3. jQuery in Action, Bear Bibeault, Yehuda Katz, and Aurelio De Rosa,Third Edition, Manning Publications
4. https://www.w3schools.com/

Course Outcomes:

After completion of the course Students will be able to:

1. Understand and apply the basic html markups in designing web pages.
2. Apply and design the web pages with images, audio, videos, tables and form controls.
3. Apply the cascading style sheets to web pages.
4. Understand and apply the JavaScript concepts in designing web pages
5. Understand and apply the JQuery concepts in designing web pages.

Mapping of COs and POs:

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

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(AN AUTONOMOUS INSTITUTION)

II B. Tech I Semester **L T P**
0 0 3

7G136-ADVANCED DATA STRUCTURES LAB THROUGH C++

Course Objectives:

- To make the student learn an object oriented way of solving problems.
- To make the student write ADTs for all data structures.
- To make the student learn different algorithm design techniques.

Week1:

a) Write a C++ program to implement the access control.
b) Write a C++ program to implement the static member function.
c) Write a C++ program to implement the parameter passing methods.

Week2:

a) Write a C++ program to implement the friend function.
b) Write a C++ program to implement the inline method.
c) Write a C++ program to implement the dynamic memory allocation and Deallocation.

Week 3:

a) Write a C++ program to implement the exception handling.
b) Write a C++ program to implement the constructor overloading.
c) Write a C++ program to implement the function overloading.

Week4:

a) Write a C++ program to implement the Operator overloading.
b) Write a C++ program to implement the simple inheritance.
c) Write a C++ program to implement the multiple inheritance.

Week5:

a) Write a C++ program to implement the virtual function.
b) Write a C++ program to implement the abstract class.
c) Write a C++ program to implement the class template.

Week6:

Write a C++ programs to implement the following using an array.

a) Stack ADT b)Queue ADT

Week7:

Write a C++ programs to implement the following using a singly linked list.

a) Stack ADT b)Queue ADT

Week8:

Write a C++ program to implement all the functions of a dictionary ADT using hashing.

Week9:

Write a C++ program to perform the following operations on Binary Trees.

a) Insertion b) Deletion c) Searching

Week10:

Write C++ programs to perform the traversals for the given binary tree.

a) Preorder b) Inorder c) Postorder

Week11:

Write C++ programs for priority queue implementation using Heaps.

a) Min Heap Insertion b) Min Heap Deletion

c) Max Heap Insertion d) Max Heap Deletion

Week12:

Write a C++ program to perform the following operations on Binary Search Trees.

a) Insertion b) Deletion c) Searching

Week13:

Write a C++ program to perform the following operations on AVL Trees.

a) Insertion b) Deletion c) Searching

Week14:

a) Write a C++ Program to implement Boyer-Moore pattern matching algorithm.

b) Write a C++ Program to implement Knuth-Morris-Pratt pattern matching algorithm.

(Note: Use Class Templates for the above Data Structure Programs)

Text Books:

1. Adam Drozdek, *Thomson. Data Structures and Algorithms in C++*. 2007-2008, 3rd Ed. Page 36 of 95.
2. D.S. Malik, *Data Structures using C++*. Thomson.

Course Outcomes:

Upon successful completion of this Lab the student will be:

1. Able to know about Object oriented programming.
2. Able to use Abstract Data Types in the programs.
3. Able to understand the OOP principles like Encapsulation, Inheritance, Polymorphism were frequently used.
4. Able to design Trees and their operations.
5. Able to understand the implementation of Pattern Matching Algorithm.

Mapping of COs and POs:

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

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(AN AUTONOMOUS INSTITUTION)

II B. Tech I Semester **L T P**
0 0 3

7G137-DATA BASE MANAGEMENT SYSTEMS LAB

Course Objectives:

1. To Understanding Conceptual Database Management systems.
2. To understand the principles of Data Modelling using Entity relationships to Database design.
3. To Understand SQL, and its syntax for Various Key Constraints.
4. To Use aggregate functions date time functions.
5. To Use PL/SQL for implementing object level data

Week1:

Draw **Relational Databases** and **ER Diagrams** for the following applications.

a) **Student Information System**

Student(Student No, Student Name, Address, Mobile No, Email ID, Institute Name, Branch Name, Fee, Mark1, Mark2, Mark3, Mark4, Mark5,TotalMarks,Percentage,Grade)

b) **Employee Information System**

Employee (Employee ID, Employee Name, Address, Mobile No, Email ID, Organization Name, Employee Designation, Basic Salary, DA, HRA, Gross Salary, Deductions, Net Salary)

c) **Customer Information System**

Customer (Customer ID, Customer Name, Address, Mobile No, Email ID, Shop Name, Product Code, Product Name, Quantity, Cost per Unit, Total Bill, Discount, Net Bill)

Week 2:

Write SQL queries to **CREATE TABLES** for various databases using **DDL** commands (**i.e.** CREATE, DESCRIBE, ALTER, DELETE, DROP).

Week 3:

Write SQL queries to **MANIPULATE TABLES** for various databases using **DML** commands (**i.e.** INSERT, SELECT, UPDATE, DELETE, TRUNCATE).

Week 4:

Write SQL queries to create **VIEWS** for various databases (**i.e.** CREATE VIEW, UPDATE VIEW, ALTER VIEW, and DELETE VIEW).

Week 5:

Write SQL queries to perform **RELATIONAL SET OPERATIONS** (**i.e.** UNION, UNION ALL, INTERSECT, MINUS, CROSS JOIN, NATURAL JOIN).

Week 6:

Write SQL queries to perform **SPECIAL OPERATIONS** (**i.e.** ISNULL, BETWEEN, LIKE, IN, EXISTS)

Week 7:

Write SQL queries to perform **JOIN OPERATIONS** (**i.e.** CONDITIONAL JOIN, EQUI JOIN, LEFT OUTER JOIN, RIGHT OUTER JOIN, FULL OUTER JOIN)

Week 8:

Write SQL queries to perform **AGGREGATE OPERATIONS** (**i.e.** SUM, COUNT, AVG, MIN, MAX).

Week 9:

Write SQL queries to perform **ORACLE BUILT-IN FUNCTIONS (i.e.** DATE, TIME).

Week 10:

Write SQL queries to perform **KEY CONSTRAINTS (i.e.** PRIMARY KEY, FOREIGN KEY, UNIQUE NOT NULL, CHECK, DEFAULT).

Week 11:

Write **PL/SQL** programs for

a. Calculating the factorial of given number.
b. Finding the given number is Prime Number or not.
c. Displaying the Fibonacci series up to an integer.

Week 12:

Write PL/SQL program to implement **Stored Procedure** on table.

Week 13:

Write PL/SQL program to implement **Stored Function** on table.

Week 14:

Write PL/SQL program to implement **Trigger** on table.

Week 15:

Write PL/SQL program to implement **Cursor** on table.

Text Books:

1. Raghurama Krishnan, JohannesGehrke, *Data base Management Systems.*TataMcGrawHill.
2. Peter Rob, AnandaRao and Carlos Corone, *Database Management Systems.*CengageLearning.
3. Rick F.VanderLans, *Introduction to SQL*.Pearson Education.
4. B.RosenZweig and E.Silvestrova,*Oracle PL/SQL*. Pearson Education.
5. Steven Feuerstein.*OraclePL/SQL Programming.*
6. Dr. P. S. Deshpande, *SQL&PL/SQL for Oracle 10g*. Black Book, DreamTech.
7. J. J. Patrick, *SQL fundamentals*. Pearson Education.

Course Outcomes:

1. Able to Implement ER-Diagrams for Various Applications
2. Able to Design database with Key Constraints and use the SQL commands such as DDL, DML, DCL, TCL to access data from database objects.
3. Able to Implement Views in order to retrieve information from the different kinds of the user.
4. Able to Implement Relational, Special, Join Operators, Oracle built-in functions and Aggregate functions.
5. Able to Execute PL/SQL Programming including stored procedures, stored functions, cursors, packages.

Mapping of COs & POs:

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

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(ANAUTONOMOUSINSTITUTION)

II B.Tech I Semester **L T P**
0 0 3

7G138-Web Programming Lab

Course Objectives:

- Students will easily can develop Static web pages
- Students can apply CSS to webpages
- Students can write client side scripting programs using JavaScript.

1. Create HTML Pages contains
   a. Basic text formatting Elements
   b. Block and Inline Elements
2. Create Html pages Contains
   a. Different Types of LISTs
   b. Text Processing Tags
3. Create HTML Pages Contains links and Navigation
   a. How to link between pages of your site
   b. How to link to other sites
   c. How to structure the folders on your website
   d. How to link to specific parts of a page in your site
4. Create HTML Pages which can work with Images, Audio and Video elements
5. Create HTML Pages contains Table element.
6. Create HTML Pages with Form elements.
7. Apply Different types of CSS to the HTML pages.
   a. Styling Text .
   b. Styling LINKS.
   c. Styling Backgrounds.
   d. Styling Lists.
   e. Styling Tables.
8. Simple XML Script with DTD.
9. Simple JavaScript Programs for the following
   a. Functions.
   b. Control Statements.
   c. Loop Statements.

10. Handling JavaScript Events.
    a. Window Events.
    b. User Events (Actions performed on HTML FORM elements using Keyboard and Mouse)
11. Sample Java Script Programs to work with BUILT-IN Objects.
12. Working with jQuery: Environment setting to work with jQuery
    a. Sample jQuery Programs to work with DOM.
    b. Event Handling .
13. Sample program for jQuery with Ajax.
14. Sample web page with jQuery UI.

Text Books:

1. Beginning HTML and CSS Rob Larsen, Wrox Programmer to Programmeer.

Reference books:

1. JavaScript and JQuery: Interactive Front-End Web Development,Jon Duckett, Wiley Publications
2. Web Design with HTML, CSS, JavaScript and jQuery Set, Jon Duckett, Wiley Publications
3. jQuery in Action, Bear Bibeault, Yehuda Katz, and Aurelio De Rosa,Third Edition, Manning Publications
4. https://www.w3schools.com

Course Outcomes:

After completion of the course Students will be able to:

1. Apply the basic html markups in designing web pages.
2. Apply and design the web pages with images, audio, videos, tables and form controls.
3. Apply the cascading style sheets to web pages.
4. Apply the JavaScript concepts in designing web pages
5. Apply the jQuery concepts in designing web pages.

Mapping of COs and POs:

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

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(AN AUTONOMOUS INSTITUTION)

II B.Tech II Semester **L T P**
3 1 0

7GC42-PROBABILITY AND STATISTICS
(Common to CE, ME & CSE)

Course Objectives:

- The courses shall enable the students quantify the measure of uncertainty
- The course explains the concepts of probability distributions.
- The course elaborates on sampling distribution and estimation.
- The course provides the students with statistical techniques in testing the hypothesis.

UNIT I

Probability: Sample space and events – Probability – The axioms of probability – Some Elementary theorems - Conditional probability – Baye's theorem.

Random variables – Discrete and continuous – Distribution functions - mean and variance.

UNIT II

Binomial distribution –Poison distribution- Uniform distribution - Normal distribution. Fitting of Binomial distribution –Poison distribution-

UNIT III

Sampling distribution: Population and sample - Sampling distributions of means (σ known and unknown).

Estimation: Point estimation – interval estimation - one mean &one proportions for small samples –two means two proportions for large sample.

UNIT IV

Test of Hypothesis – Large samples: hypothesis concerning one and two means. Test of proportions (one and two).

Small samples: t- test.

UNIT V

$\chi 2$–Tests: goodness of fit, rxc contingency tables, F-test for two variances.

Text Books:

3. Fundamentals of Mathematical Statistics, S C Gupta and V K Kapoor, Sultan schand & sons.
4. A text book of Probability & Statistics, B. V. Ramana, Tata McGraw Hill.

Reference Books:

1. Advanced Engineering Mathematics, Erwin Kreyszig, 8th edition, New Age International (Pvt) Limited.
2. Probability & Statistics, T. K. V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company.
3. Probability & Statistics for Engineers, Miller and John E. Freund, Prentice Hall of India.
4. Higher Engineering Mathematics, B.S.Grewal, Khanna publishers-43rdEdition (2014)
5. Probability and statistics for engineers and scientists, 8th edition, Ronal E.Walpole, Raymond H.Myers, Sharon L.Myers, Keying Ye, Pearson Education.

Course Outcomes:

Student will be able to

1. Understand the basic concepts of probability and random variables.
2. Gain the knowledge on probability distributions.
3. Understand the concepts of sampling distributions and theory of estimation.
4. Able to test various hypothetical statements for large and small samples.
5. Provide the knowledge in testing the goodness of fit and decision-making process.

Mapping of COs and POs:

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

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(AN AUTONOMOUS INSTITUTION)

II B.Tech II Semester **L T P**
3 1 0

7G141- COMPUTER ORGANIZATION

Course Objectives:

- To show the basic structure and operation of a computer.
- To illustrate register-transfer-level language.
- To demonstrate control memory and micro programs.
- To analyze arithmetic operations and memory organization.
- To assess the basic foundations for Parallel Processing techniques.

UNIT I

DIGITAL COMPUTERS: Digital computers, A Brief History of Computers, Computer components, Bus Structure.

DATA REPRESENTATION: Fixed Point Representation. Floating – Point Representation.

UNIT II

REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS: Register Transfer language, register Transfer Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit, Instruction codes, computer registers, and Computer instructions – Instruction cycle.

Memory – Reference Instructions, Input – Output and Interrupt, STACK organization, Instruction format, addressing modes, DATA Transfer and manipulation, Program control, Reduced Instruction set computer.

UNIT III

MICRO PROGRAMMED CONTROL: Control memory, Address sequencing, micro program example, and design of control unit, Hardwired control. Micro programmed control.

UNIT IV

COMPUTER ARITHMETIC: Algorithms for fixed point and floating point addition, subtraction, multiplication and division operations, hardware implementation of arithmetic and logical operations.

MEMORY ORGANIZATION: Memory hierarchy, main memory, Auxiliary Memory, Cache Memory, Virtual Memory.

UNIT V

INPUT-OUTPUT ORGANIZATION: Peripheral Devices, Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt Direct memory Access, Input –Output Processor (IOP) , Serial communication.

PIPELINE AND VECTOR PROCESSING: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

Text Books:

1. M.MorrisMano, *Computer Systems Architecture.* Pearson/PHI, 3rdEd.
2. William Stallings, *Computer Organization and Architecture.* Pearson/PHI, 6thEd.

Reference Books:

1. Carl Hamacher, ZvonksVranesic, SafeaZaky, *Computer Organization*. McGraw Hill, 5thEd.
2. Andrew S. Tanenbaum,*Structured Computer Organization*. PHI/Pearson, 4thEd.
3. SivaraamaDandamudi, *Fundamentals or Computer Organization and Design.* Springer Int. Edition.

Course Outcomes:

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

1. Show the basic structure and operation of a computer.
2. Illustrate register-transfer-level language.
3. Demonstrate control memory and micro programs.
4. Analyze arithmetic operations and memory organization.
5. Assess the basic foundations for parallel processing techniques.

Mapping of COs and POs:

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

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(AN AUTONOMOUS INSTITUTION)

II B.Tech II Semester

L	T	P
3	1	0

7G142- DESIGN AND ANALYSIS OF ALGORITHMS

Course Objectives:

- To analyze the asymptotic performance of algorithms.
- To study various algorithmic design techniques of divide and conquer and greedy method.
- To utilize data structures and/or algorithmic design techniques in solving new problems with dynamic programming method.
- To study various algorithmic design techniques of back tracking and branch and bound.
- To know and understand basic computability concepts and the complexity classes P, NP, and NP-Complete and study some techniques for solving hard problems

UNIT I

INTRODUCTION: Algorithm, Pseudo Code for algorithms, performance analysis-Space complexity, Time Complexity, Asymptotic Notation-Big Oh Notation, Omega Notation, Theta notation and Little Oh notation, Amortized complexity, Sets-Disjoint set operations, Union and Find algorithms.

UNIT II

DIVIDE AND CONQUER: General Method, applications- Binary Search, Quick sort, Merge Sort, Strassen's Matrix multiplication.

GREEDY METHOD: General Method, applications-Job sequencing with dead-lines, knapsack problem, Minimum-cost Spanning trees, Single source shortest path.

UNIT III

DYNAMIC PROGRAMMING: General Method, applications- Matrix Chain multiplication, Optimal Binary search trees, 0/1 Knapsack, All pairs shortest path, The Travelling person problem, Reliability design.

UNIT IV

BACKTRACKING: General Method, applications- 8- queen problem, sum of subsets, graph coloring, Hamiltonian cycles.

BRANCH AND BOUND: General Method, applications-Travelling Sales Person (*), and 0/1 knapsack problem-LC Branch and Bound Solution, FIFO Branch and Bound solution.

UNIT V

NP-HARD AND NP-COMPLETE PROBLEMS: Basic Concepts, nondeterministic algorithms, the classes-NP-Hard and NP Complete, Cook's Theorem

Text Books:

1. Ellis Horowitz, SartajSahni and Rajasekharam, Fundamentals of Computer Algorithms. Galgotia publications Pvt. Ltd.
2. ParagHimanshu Dave, HimanshuBhalchandra Dave, Design and Analysis Algorithms. Pearson.
3. M.T. Goodrich and R.Tomassia,Algorithm Design: Foundations, Analysis and Internet Example.Johnwiley and sons.

Reference Books:

1. R.C.T.Lee,S.S .Tseng,R.C.Chang and T.Tsai, Introduction to Design and analysis of Algorithms,A strategic approach.McGraw Hill.
2. Aho,Ullman and Hopcroft,Design and Analysis of algorithms.Pearson Education.

Course Outcomes:

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

1. Able to state and understand different notations for time complexity of the algorithms.
2. Able to classify and apply divide and conquer, greedy techniques to solve the problems.
3. Able to usedynamicprogrammingtechnique to solve the problems.
4. Able to understand and solvedifferent applications of backtracking, and branch and boundtechniques.
5. Able to identify that a given problem is NP-Complete or not.

Mapping of COs and POs:

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

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

II B.Tech II Semester

L	T	P
3	1	0

7G143-FORMAL LANGUAGES AND AUTOMATA THEORY

Course Objectives:

- To know the basic properties of Formal Languages, Deterministic and Non Deterministic Finite Automata.
- To Construct Finite Automata for regular expressions
- To Illustrate the Context free languages and grammars, Normalizing CFG.
- To differentiate the deterministic and nondeterministic PDA.
- Able to apply the properties of Turing machines to solve the real time problems.

UNIT I

Introduction: Strings, Alphabet, Language, Operations, Finite State Machine, definitions, Finite Automaton Model, Acceptance of Strings and Languages, Deterministic Finite Automata and Non-Deterministic Finite Automata, Chomsky hierarchy of languages, Transition Diagrams and Language Recognizers.

Finite Automata: NFA with Є transitions - Significance, acceptance of languages.

Conversions and Equivalence: Equivalence between NFA with and without Є transitions, NFA to DFA conversion, minimization of FSM, Equivalence between two FSMs

Finite Automata with output- Moore and Mealy machines.

UNIT II

Regular Languages: Regular sets, Regular Expressions, Identity Rules, Constructing Finite Automata for a given Regular Expressions, Conversion of Finite Automata to Regular Expressions. Pumping lemma of regular sets, Closure Properties of Regular Sets **(proofs not required).**

UNIT III

Grammar Formalism: Regular Grammars-Right Linear and Left Linear Grammars, Equivalence between Regular Grammar and FA, Inter Conversion, Context free grammar, derivation trees, and sentential forms, Right Most and Left Most derivation of Strings.

Context Free Grammars: Ambiguity in Context Free Grammars. Minimization of Context Free Grammars, Chomsky Normal Form, Greibach Normal Form, Pumsping Lemma for Context Free Languages. Enumeration of properties of CFL **(proofs omitted).**

UNIT IV

Push down Automata: Push Down Automata, Definition, model, acceptance of CFL, acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, inter conversion. **(Proofs not required)**. Introduction to DCFL and DPDA.

UNIT V

Turing Machine: Turing Machine, definition, model, design of TM, Computable functions, Recursively Enumerable Languages, Church's hypothesis, counter machine, types of Turing machines (proofs not required).

Computability Theory: Linear Bounded Automata and Context Sensitive Language, LR (0) grammar, Decidability of problems, Universal Turing Machine, Undecidability of Post Correspondence Problem, Turing reducibility.

Text Books:

1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J. D. Pearson Education.
2. Introduction to Theory of Computation - Sipser 2nd edition Thomson

Reference Books:

1. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
2. Introduction to languages and the Theory of Computation, John C Martin, TMH
3. "Elements of Theory of Computation", Lewis H.P. &Papadimition C.H. Pearson /PHI.
4. Theory of Computer Science and Automata languages and computation - Mishra and Chandrashekaran, 2nd edition, PHI.
5. Theory of Computation, By K.V.N. SUNIT-ha and N.Kalyani

Course Outcomes:

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

1. Understand Basic Concepts of Formal Languages, Deterministic and Nondeterministic Finite Automata.
2. Understand And Apply Regular Expressions in Real Time Applications
3. Analyze Regular Language and Context Free Grammar
4. Illustrate Push Down Automata for a given Language
5. Apply Mathematical and Formal Techniques for solving practical problems through Turing Machine in Languages.

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	-	-	-	-	-	-	-	-	-
2	3	3	-	-	-	-	-	-	-	-	-	2
3	3	-	-	3	-	-	-	-	-	-	-	-
4	3	-	3	3	-	-	-	-	-	-	-	-
5	3	3	3	-	-	-	-	-	-	-	-	-

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

II B.Tech II Semester

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3	1	0

7G144-OBJECT ORIENTED PROGRAMMING USING JAVA

Course Objectives:

- Student will understand and apply the concepts of OOP's using java and create console based applications.
- Students will be able to understand, apply and analyze the reusability concepts like packages, interfaces, and exception handling
- Students will be able to understand and implement the multi threading and collection frame work in real time applications developed using JAVA.
- Students will be able to understand and apply the Generic programming and Lambda Expressions.
- Students will be able to apply and analyze the Collection Frame work.

UNIT I

The Java Language: The History and Evolution of Java, Java's Magic: The Bytecode, The Java Buzzwords, The Evolution of Java, Java SE 8. **Object-Oriented Programming -**Two Paradigms, Abstraction, The three OOP Principles, A First Simple Program-Entering the Program, Compiling the Program, Running the Program, Overview of Java, Data Types, Variables, Arrays, operators and control statements.

Classes and Objects:

Class Fundamentals, Declaration of Objects, Assigning Object Reference Variables, Introducing Methods, Adding a Method to the Class, Returning a Value, Adding a Method That Takes Parameters, Constructors, Parameterized Constructors, The this Keyword, Instance Variable Hiding, Garbage Collection, The finalize( ) Method, Overloading Methods, Overloading Constructors, Using Objects as Parameters, A Closer Look at Argument Passing, Returning Objects, Recursion, Introducing Access Control, Understanding static, Introducing final, Arrays Revisited, Introducing Nested and Inner Classes, Exploring the String Class.

UNIT II

Inheritance : Inheritance Basics, Member Access and Inheritance, A Practical Example, Accessing super class members, Usage super key word, Creating a Multilevel Hierarchy, Accessing Constructors in inheritance, Method Overriding, Dynamic Method Dispatch, Abstract Classes, Using final with Inheritance. Object Class.

Packages and Interfaces: Packages, Defining a Package, Finding Packages and CLASSPATH, A Short Package Example, Access Protection, an Access Example, Importing Packages.

Interfaces: Defining an Interface, Implementing Interfaces, Nested Interfaces, Applying Interfaces, Variables in Interfaces, Interfaces Can Be Extended, Default Interface Methods, Default Method Fundamentals, A More Practical Example, Multiple Inheritance Issues, Use static Methods in an Interface, Final Thoughts on Packages and Interfaces

UNIT III

Exception Handling: Exception-Handling Fundamentals, Exception Types, Uncaught Exceptions, Using try and catch, Displaying a Description of an Exception, Multiple catch Clauses, Nested try Statements, throw, throws, finally, Java's Built-in Exceptions, Creating Your Own Exception Subclasses.

Multithreaded Programming: The Java Thread Model, Thread Priorities, Synchronization, Messaging, The Thread Class and the Runnable Interface, The Main Thread, Creating a Thread, Implementing Runnable, Extending Thread, Choosing an Approach, Creating Multiple Threads, Using isAlive( ) and join( ), Thread Priorities, Synchronization Using Synchronized Methods, The synchronized Statement, Interthread Communication, Deadlock, Suspending, Resuming, and Stopping Threads, Obtaining A Thread's State, Using Multithreading.

UNIT IV

Generics : What Are Generics, Generics Work Only with Reference Types, A Generic Class with Two Type Parameters, The General Form of a Generic Class, Bounded Types, Using Wildcard Arguments, Bounded Wildcards Creating a Generic Method, Generic Constructors, Generic Interfaces, Raw, Generic Class Hierarchies, Using a Generic Superclass, A Generic Subclass, Run-Time Type Comparisons Within a Generic Hierarchy, Casting, Overriding Methods in a Generic Class, Type Inference with Generics, Erasure, Bridge Methods, Ambiguity Errors, Some Generic Restrictions, Type Parameters Can't Be Instantiated, Restrictions on Static Members, Generic Array Restrictions, Generic Exception Restriction .

Lambda Expressions: Introducing Lambda Expressions, Lambda Expression Fundamentals, Functional Interfaces, Some Lambda Expression Examples, Block Lambda Expressions, Generic Functional Interfaces, Passing Lambda Expressions as Arguments, Lambda Expressions and Exceptions, Lambda Expressions and Variable Capture, Method References, Method References to static Methods, Method References to Instance Methods, Method References with Generics, Constructor References, Predefined Functional Interfaces.

UNIT V

java.util Package:

The Collections Framework: Collections Overview, The Collection Interfaces: The Collection Interface, The List Interface, The Set Interface, The Sorted Set Interface; The Collection Classes: The ArrayList Class, The LinkedList Class, The Hash SetClass, The LinkedHashSet Class, The TreeSet Class, The EnumSetClass, Accessing a Collection via an Iterator, Using an Iterator, The For-Each Alternative to Iterators, Spliterators, Storing User-Defined Classes in Collections, The Random Access Interface, Working with Maps, The Map Interfaces, The Map Classes, The Collection Algorithms. Arrays, The Legacy Classes and Interfaces, The Enumeration Interface, Vector, Stack, Dictionary, Hashtable, Properties, Using store( ) and load( ), Parting Thoughts on Collections, StringTokenizer, Scanner, The Scanner Constructors, ScanningBasics, Some Scanner Examples.

Text Book:

1. Herbert Schildt.Java. The complete reference, TMH. 9th Edition.

Reference Books:

1. J.Nino and F.A. Hosch, An Introduction to programming and OO design using Java, John Wiley&sons.
2. Y. Daniel Liang, Introduction to Java programming, Pearson Education. 6th Edition
3. R.A. Johnson- Thomson, An introduction to Java programming and object oriented application development,
4. Cay.S.Horstmann and Gary,Cornell, Core Java 2, Vol. 1, Fundamentals, Pearson Education. 7th Edition,
5. Cay.S.Horstmann and GaryCornell Core Java 2, Vol 2, Advanced Features, Pearson Education. 7th Edition,
6. P. Radha Krishna, Object Oriented Programming through Java,University Press.

Course Outcomes:

After Completion of the Course Students are getting…

1. Ability to Understand and apply fundamentals of object-oriented programming features through Java Programming Language.
2. Ability to apply and analyze reusability concepts like Inheritance, interfaces and packages in real time applications developed using JAVA.
3. Ability to acquire knowledge on multithreading, exception handling and apply the same in developing real time java based applications.
4. Ability to understand and apply Generic Programming and Lambda Expressions.
5. Ability to understand and apply the Collection framework.

Mapping of COs and POs:

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

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II B. Tech II Semester

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7G145-OPERATING SYSTEMS

Course Objectives:

A student understands

- The operating system architecture and its functions.
- About process & thread synchronization, scheduling.
- About memory, files, I/O and mass storage.
- About protection & security of operating systems.

UNIT I

Operating Systems Overview: Introduction, what operating systems do? Computer system Organization & architecture, Operating system operations, distributed systems, special purpose systems.

Systems structures: operating system services, systems calls, types of System calls, system programs, operating system structure and generation.

Process Management: Process concepts, process Scheduling, operations on process, Process Scheduling Basic Concepts, Scheduling Criteria, scheduling algorithms, IPC, communication in Client-Server systems.

UNIT II

Multithreaded Programming: Overview, Multithreading models, thread libraries, thread issues and thread scheduling, multiprocessor scheduling.

Concurrency: Process synchronization, the critical-section problem, Peterson‘s Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions.

UNIT III

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

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation.

Virtual Memory Management: Demand paging, page-replacement algorithms, Allocation of frames, Thrashing, Memory mapped files, Allocating Kernel Memory

UNIT IV

File system Interface: The concept of a file, Access Methods, Directory structure, File system mounting, File sharing, protection.

File System implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management, Efficiency and performance.

Mass-storage structure: overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management, RAID structure, stable-storage implementation, Tertiary storage structure.

UNIT V

I/O Systems: I/O Hardware, Application I/O interface, Kernel I/O Subsystem, Transforming I/O requests to hardware operations.

Protection: Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language – Based Protection.

Security: The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer –security classifications.

Text Books:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley.
2. Operating Systems, A Concept based Approach-D.M.Dhamdhere, Second Edition, TMH.

Reference Books:

1. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition–2009, Pearson Education.
2. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
3. Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.
4. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.

Course Outcomes:

After completion of the course student will be

1. Able to understand operating system functionalities, process concepts, scheduling criteria and scheduling algorithms.
2. Able to analyze thread, process synchronization and cite the various approaches to solving the problem of mutual exclusion.
3. Able to detect, recovery and avoidance deadlock, and able to judge memory management.
4. Able to manage files, mass storage and I/O.
5. Able to evaluate better protection and security method for the operating system.

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
2	3	3		3								
3	3	3										3
4	3	3		3								
5	3	3	3	3								3

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II B. Tech II Semester

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7G147-DESIGN AND ANALYSIS OF ALGORITHMS LAB

Course Objectives:

Upon completion of this course, students will be able to do the following:

- Analyze the asymptotic performance of algorithms.
- Write rigorous correctness proofs for algorithms.
- Demonstrate a familiarity with major algorithms and data structures.
- Apply important algorithmic design paradigms and methods of analysis.
- Synthesize efficient algorithms in common engineering design situations.

Program 1: Sort a given set of elements using the Quicksort method and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versus n.

Program 2: Implement a parallelized Merge Sort algorithm to sort a given set of elements and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versus n.

Program 3: Find Minimum Cost Spanning Tree of a given undirected graph Prim's algorithm.

Program 4: Find Minimum Cost Spanning Tree of a given undirected graph using Kruskal's algorithm.

Program 5: Implement the 0/1 knapsack problem by the following.

a) Greedy algorithm. b) Dynamic programming algorithm

Program 6: Find optimal ordering of matrix multiplication using Dynamic programming method.

Program 7: Implement dynamic programming algorithm to solve all pairs shortest path problem.

Program 8: Uses dynamic programming algorithm to solve the optimal binary search tree problem.

Program 9: Consider the problem of eight queens on an (8x8) chessboard. Two queens are said to attack each other if they are on the same row, column, or diagonal. Implements backtracking algorithm to solve the problem i.e. place eight non-attacking queens on the board.

Program 10: Implement the 0/1 knapsack problem using the Branch and bound algorithm.

Program 11: Implement the traveling sales person's problem using the Branch and Bound.

Text Books:

1. Richard F.Gilberg, BehrouzA.Forouzan, Thomson, "Data Structures, A Pseudocode Approach with C++", 1st ed., Business Information Press, 2007.
2. D.S.Malik, Thomson, "Data Structures Using C++", 1st ed., Cengage Learning, 2007.
3. Ellis Horowitz, SatrajSahni and Rajasekharam, "Fundamentals of Computer Algorithms", 2nd ed., Galgotia publications pvt. Ltd, 2006.

Course Outcomes:

Students who complete the course will have demonstrated the ability to do the following:

1. Analyze worst-case running times of algorithms using asymptotic analysis.
2. Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Synthesize divide-and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
3. Trace the greedy paradigm and explain when an algorithmic design situation calls for it. Synthesize greedy algorithms, and analyze them
4. Outline the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Synthesize dynamic-programming algorithms, and analyze them.
5. Narrate the Back tracking and Banch and Bound paradigm and explain when an algorithmic design situation calls for it.

Mapping of COs and POs:

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

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II B.Tech II Semester

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7G148-JAVA LAB

Course Objectives:

- Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
- Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- Be aware of the important topics and principles of software development.
- Have the ability to write a computer program to solve specified problems.
- Be able to use the Java SDK environment to create, debug and run simple Java programs

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space
- JDK Kit. Recommended

Week1:

a) Write a Java program to display Fibonacci series between 1 to n.
b) Write a Java program to perform the arithmetic operations using switch case statement.
c) Write a Java program to calculate sum of 5 subjects and find percentage.

Week 2:

a) Write a Java program to display all strong numbers between 1 to n.
b) Write a Java program to find multiplication of two matrices.
c) Write a Java program to convert temperature from Centigrade to Fahrenheit and Fahrenheit to Centigrade.

Week 3:

a) Write a Java program to implement the access control.
b) Write a Java program to implement the constructor overloading.
c) Write a Java program to implement the method overloading.

Week 4:

a) Write a Java program to find the factorial of a given number using recursion.
b) Write a Java program to find whether the given string is palindrome or not.
c) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.

Week 5:

a) Write a Java program to implement the method overriding.

b) Write a Java program to implement the multilevel inheritance.

c) Write a Java program to implement dynamic method dispatch.

Week 6:

a) Write a java program for abstract class implementation.

Note: - class Shape that contains an empty method named numberOfSides(). Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method numberOfSides() that shows the number of sides in the given geometrical figures.

b) Write a Java program to implement the package concept.

c) Write a Java program to implement the multiple inheritance using interfaces.

Week 7:

a) Write a Java program to implement the exception handling mechanism.

b) Write a Java program to implement the nested try statement.

c) Write a Java program to implement the own exception class.

Week 8:

a) Write a Java program for multi-thread implementation.

Note: First thread displays "Good Morning" every one second, the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every three seconds.

b) Write a Java program to implement producer consumer problem using inter-thread communication mechanism.

c) Write a Java program to use the isAlive() and join() methods.

Week 9:

Any four programs on Generic Programming.

Week 10:

Any four programs on Lambda expressions.

Week 11:

a) Write a Java program to display the sum of all the integers of given line of integers using StringTokenizer class.

b) Write a Java program to implement stack ADT.

Week 12:

a) Write a Java program to converts infix expression into postfix form

b) Write a Java program to evaluate the postfix expression.

Week 13:

a) Write a program to implement queue ADT.

b) Write a program to implement linkedlist

Text Books:

1. H.M.Dietel and P.J.Dietel, Java How to Program 6thEdition, Pearson Education/PHI
2. Y.DanielLiang,Introduction to Java programming, Pearson Education, 6thEdition.
3. Cay Horstmann,Big Java, 2ndedition, Wiley Student Edition, Wiley India Private Limited.
4. Herbert Schildt.Java. The complete reference, TMH. 9thEdition.

Course Outcomes:

1. Design and implement the programs to demonstrate classes, objects and encapsulation.
2. Demonstrate and implement the principles of inheritance, polymorphism, constructor overloading, and method overloading
3. Understanding the use of packages, creation of packages, importing the packages and the importance of the collection of framework
4. Implementation of multithread programming, Thread Priority, Exception Handling and Creation of own Exceptions.
5. Implement and demonstrate Simple Applet, Applet Communication, Client Server Communication, and Swings for Windows GUI-Applications.

Mapping of COs and POs:

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

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7G149-OPERATING SYSTEMS LAB

Course Objectives:

Students will understand how to write programs for

- The threads, the process scheduling and synchronization
- deadlock, detect and avoid deadlock
- paging technique and its replacement algorithms
- file management techniques

System/ Software Requirement:

- Intel based desktop PCs LAN CONNECTED with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space.
- Use any language for implementation.

List of Programs:

1. Simulate multithreaded concept using the Pthreads API.
2. Simulate the following CPU scheduling algorithms
   a) FCFS b) SJF c) Round Robin d) Priority
3. Simulate synchronization of producer-consumer problem.
4. Simulate process synchronization using
   a) Binary semaphore. b) Counting semaphore.
5. Simulate dining philosopher'sproblem solution using monitor.
6. Simulate
   a)Bankers Algorithm for Dead Lock Avoidance
   b)Dead Lock Detection.
7. Simulate the following page replacement algorithms
   a) FIFO b) LRU c) LFU d) optimal
8. Simulate Paging Technique of memory management.
9. Simulate file Allocation strategies:
   a) Sequential b) indexed c) linked
10. Simulate the following File Organization Techniques
    a) Single level directory b) Two level c) Hierarchical

Text Books:

- Thomas W. Doeppner, Operating Systems In Depth: Design and Programming, John Wiley & Sons.
- Dan Parks Sydow, Programming the Be Operating System: Writing Programs for the Be Operating System, O'Reilly.

Course Outcomes:

Upon the completion of the lab, students will be:

1. Able to do experiments withthethreads,the process scheduling and synchronization
2. Able to do experiments with deadlock, detect and avoid deadlock
3. Able todo experiments withpaging technique and its replacement algorithms
4. Able to do experiments with file management techniques

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						3
2	3	3	3	3		3						3
3	3	3	3	3		3						3
4	3	3	3	3		3						3