ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABI
OF
ELECTRONICS AND INSTRUMENTATION ENGINEERING
FOR
I B.TECH REGULAR FOUR YEAR DEGREE COURSE

(for the batches admitted from 2016-2017)

CHOICE BASED CREDIT SYSTEM

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

(Affiliated to JNTUA Anantapuramu, Approved by AICTE
Accredited by NBA; NAAC with 'A' grade)

Sree Sainath Nagar, A.Rangampet, Near Tirupati - 517 102. A.P.

VISION

To be one of the Nation's premier Engineering Colleges by achieving the highest order of excellence in Teaching and Research.

MISSION

- To foster intellectual curiosity, pursuit and dissemination of knowledge.
- To explore students' potential through academic freedom and integrity.
- To promote technical mastery and nurture skilled professionals to face competition in ever increasing complex world.

QUALITY POLICY

Sree Vidyanikethan Engineering College strives to establish a system of Quality Assurance to continuously address, monitor and evaluate the quality of education offered to students, thus promoting effective teaching processes for the benefit of students and making the College a Centre of Excellence for Engineering and Technological studies.

DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING

VISION

To become a centre of excellence in creative learning and research in the field of Electronics and Instrumentation.

MISSION

- Offer comprehensive and rigorous educational program in the domain of Electronics and Instrumentation and to prepare students ready for industry & research.
- Design, develop and disseminate contempory curriculum with knowledge and skills in the fields of Control and Instrumentation to match the expectations of real time needs.
- Establish an ambient and object oriented development ecosystem for a diversity of faculty and students to foster holistic development.
- Create world class infrastructure for teaching, learning, training and research to achieve highest order of excellence in designing systems and controllers.
- Inculcate zeal for ethics among faculty, staff and students to develop creativity and innovation with value.

PROGRAM EDUCATIONAL OBJECTIVES

After few years of graduation, the graduates of B. Tech. (EIE) Program would have

1. Enrolled or completed higher education in the core or allied areas of Electronics and Instrumentation Engineering or management.
2. Successful career in Electronics and Instrumentation enabled Industries or software Industries or be an entrepreneur in the domain area.
3. Engaged in lifelong learning by keeping themselves abreast of new developments in the field of Electronics and Instrumentation.

PROGRAM OUTCOMES

On successful completion of the Program, the graduates of B. Tech. (EIE) Program will be able to:

1. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. 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. 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. 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. 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. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. 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. 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. 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.

PROGRAM SPECIFIC OUTCOMES

On successful completion of the Program, the graduates of B. Tech. (EIE) Program will be able to

1. Apply the knowledge of Electronics, Measurements, Signal Processing and Control Systems, to the solutions of real world technical problems.
2. Analyze, Design and Develop solutions in real time in the domains of Electronics, Measurements, Signal Processing and Automation.
3. Conduct investigations and address complex engineering problems with safety norms in the domains of Electronics, Measurements, Signal Processing and Automation.
4. Apply appropriate techniques, resources, and modern tools to complex engineering systems and processes in the domains of Electronics, Measurements, Signal Processing and Automation.

The Challenge of Change

*"**M**astery of change is in fact the challenge of moving human attention from an old state to a new state. Leaders can shift attention at the right time and to the right place. The real crisis of our times is the crisis of attention. Those who lead are the ones who can hold your attention and move it in a purposeful way. Transformation is nothing but a shift in attention from one form to another. The form of a beautiful butterfly breaks free from a crawling caterpillar. If you pay enough attention, you would be able to see how the butterfly hides within the caterpillar. The leader points out a butterfly when the follower sees only a caterpillar".*

- Debashis Chatterjee

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)
(Affiliated to J.N.T. University Anantapur, Anantapuramu)

ACADEMIC REGULATIONS

CHOICE BASED CREDIT SYSTEM

B.Tech. Regular Four Year Degree Program (for the batches admitted from the academic year 2016–17)
&
B.Tech. (Lateral Entry Scheme) (for the batches admitted from the academic year 2017–18)

For pursuing four year undergraduate Degree Program of study in Engineering (B.Tech) offered by Sree Vidyanikethan Engineering College under Autonomous status and herein after referred to as SVEC (Autonomous):

1. Applicability : All the rules specified herein, approved by the Academic Council, shall be in force and applicable to students admitted from the academic year 2016-2017 onwards. Any reference to "College" in these rules and regulations stands for SVEC (Autonomous).

2. Extent: All the rules and regulations, specified hereinafter shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. It shall be ratified by Academic Council in the forthcoming meeting. As per the requirements of statutory bodies, Principal, Sree Vidyanikethan Engineering College shall be the Chairman, Academic Council.

3. Admission :

3.1. Admission into First Year of Four Year B.Tech. Degree Program of study in Engineering:

3.1.1. Eligibility: A candidate seeking admission into the First Year of four year B.Tech. Degree Program should have
(i) passed either Intermediate Public Examination (I.P.E.) conducted by the Board of Intermediate Education, Andhra Pradesh, with Mathematics, Physics and Chemistry as optional courses (or any equivalent examination recognized by JNTUA, Anantapuramu) for admission as per the guidelines of Andhra Pradesh State Council of Higher Education (APSCHE).

(ii) secured a rank in the EAMCET examination conducted by APSCHE for allotment of a seat by the Convener, EAMCET for admission.

3.1.2. **Admission Procedure:** Admissions shall be made into the first year of four year B.Tech. Degree Program as per the stipulations of APSCHE, Government of Andhra Pradesh:
(a) By the Convener, EAMCET, (for Category-A Seats).
(b) By the Management (for Category-B Seats).
(c) Admissions to PIO and Foreign Nationals as per the guidelines and norms of MHRD, AICTE, APSCHE & Affiliating University.

3.2. Admission into the Second Year of Four year B.Tech Degree Program in Engineering (Lateral Entry).

3.2.1. **Eligibility:** A candidate seeking admission into the Second Year of four year B.Tech. Degree Program (Lateral Entry) should have
(i) Diploma in Engineering in the relevant branch conducted by the Board of Technical Education, Andhra Pradesh (or equivalent Diploma recognized by JNTUA, Anantapuramu).
(ii) Candidates qualified in ECET and admitted by the Convener, ECET. In all such cases for admission, when needed, permissions from the statutory bodies are to be obtained.

3.2.2. **Admission Procedure:** 20% of the sanctioned strength in each Program of study as lateral entry students or as stipulated by APSCHE shall be filled by the Convener, ECET.

4. Programs of study offered leading to the award of B.Tech. Degree Following are the four year undergraduate Degree Programs of study offered in various branches in SVEC (Autonomous) leading to the award of B.Tech (Bachelor of Technology) Degree:
1) B.Tech (Civil Engineering)
2) B.Tech (Computer Science & Engineering)
3) B.Tech (Computer Science & Systems Engineering)
4) B.Tech (Electrical & Electronics Engineering)
5) B.Tech (Electronics & Communication Engineering)
6) B.Tech (Electronics & Instrumentation Engineering)
7) B.Tech (Information Technology)
8) B.Tech (Mechanical Engineering)

5. **Duration of the Program:**

5.1 **Minimum Duration:** The program will extend over a period of four years leading to the Degree of Bachelor of Technology (B.Tech) of the JNTUA, Ananthapuramu. The four academic years shall be divided into eight semesters with two semesters per year. Each semester shall normally consist of 22 weeks (≥ 90 working days) having - Continuous Internal Evaluation (CIE)' and 'Semester End Examination (SEE)'. Choice Based Credit System (CBCS) and Credit Based Semester System

(CBSS) as suggested by UGC and Curriculum/ Course Structure as suggested by AICTE are followed. Provision is made for lateral entry of students in the Second Year of the program in all branches of study and they shall be required to satisfy the conditions of admissions thereto prescribed by the JNTUA, Ananthapuramu and Government of Andhra Pradesh.

5.2 Maximum Duration: The student shall complete all the passing requirements of the B.Tech degree program within a maximum duration of 8 years (6 years for lateral entry), these durations reckoned from the commencement of the semester to which the student was first admitted to the program.

First Semester (22 weeks)	Instruction Period: I Spell : 7 weeks II Spell: 9 weeks	16 weeks
	Mid-term Examinations: I Mid : 1 week II Mid : 1 week	2 weeks
	Preparation & Practical Examinations	2 weeks
	Semester-end examinations	2 weeks
	Semester Break	2 weeks
Second Semester (22 weeks)	Instruction Period: I Spell : 7 weeks II Spell: 9 weeks	16 weeks
	Mid-term Examinations: I Mid :1 week II Mid : 1 week	2 weeks
	Preparation & Practical Examinations	2 weeks
	Semester-end examinations	2 weeks
	Summer Vacation	6 weeks

6. Structure of the Program: Each Program of study shall consist of:
(a) Foundation Courses,
(b) Core Courses and Elective Courses.

♦ Foundation Courses are further categorized as :
(i) HS (Humanities and Social Sciences),
(ii) BS (Basic Sciences) and
(iii) ES (Engineering Sciences).

♦ Core Courses and Elective Courses are categorized as PS (Professional Courses), which are further subdivided as:
(i) PC (Professional Core) Courses,
(ii) PE (Professional Electives),
(iii) IDE (Inter Disciplinary Electives),
(iv) OE (Open Electives),
(v) Comprehensive Assessment
(vi) Seminar
(vii) PW (Project Work).

S.No	Broad Course Classification	Course Group / Category	Course Type	Range of Credits
1.	Foundation Courses	HS – Humanities and Social Sciences	Humanities, Social Sciences and Management.	**5% - 10%**
2.		BS – Basic Sciences	Mathematics, Physics and Chemistry Courses, etc.	**15% - 20%**
3.		ES – Engineering Sciences	Fundamental engineering courses.	**15% - 20%**
4.	Core Courses	PC – Professional Core	Core courses related to the Parent Discipline/ Branch of Engg.	**30% - 40%**
5.	Elective Courses	PE – Professional Electives	Elective courses related to the Parent Discipline/ Branch of Engg.	**10% - 15%**
6.		IDE - Interdisciplinary Electives	Courses in an area outside the Parent Discipline / Branch of Engg.	**5% - 10%**
7.		OE – Open Electives	Common Elective courses offered for all programs / Branches of Engg.	**5% - 10%**
8.	Core Courses	Seminar	A course of study with discussion and report.	**10% - 15%**
9.		Comprehensive Assessment	A comprehensive review of foundations and key concepts of the courses studied.	
10.		Project Work	A course of planned minor research work.	

Contact Periods: Depending on the complexity and volume of the course, the number of contact periods per week shall be assigned.

7. Credit Courses:

All Courses are to be registered by a student in a Semester to earn Credits. Credits shall be assigned to each Course in a L: T: P: C (Lecture Periods: Tutorial Periods: Practical Periods: Credits) Structure, based on the following general pattern.

- One Credit - for One Period/ Week/ Semester for Theory/ Lecture (L) Courses;
- Two Credits - for Three Periods/ Week/ Semester for Laboratory/ Practical (P) Courses.

♦ Tutorials shall not carry Credits.

i) Other student activities like NCC, NSS, Sports, Study Tour, Guest Lecture etc. shall not carry Credits.

ii) For courses like Project/Seminar/Comprehensive Online Assessment, where formal contact periods are not specified, credits are assigned based on the complexity of the work to be carried out.

The four year curriculum of a B. Tech Program of study shall have total of **180** credits (24 credits in each semester from I B. Tech. I Semester to IV B. Tech I Semester and 12 credits in IV B. Tech II Semester). However the curriculum for lateral entry students shall have a total of **132** credits (24 credits in each semester from II B. Tech. I Semester to IV B. Tech I Semester and 12 credits in IV B. Tech II Semester).

8. Choice Based Credit System (CBCS):

Choice Based Credit System (CBCS) is introduced based on UGC guidelines in order to promote:

- Student centered learning
- Cafeteria approach
- Students to learn courses of their choice
- Learning at their own pace
- Interdisciplinary learning
- The total credits for the Programme is **180** for regular students and **132** for lateral entry students.
- A student has a choice of registering for credits from the theory courses offered in the program ensuring the total credits in a semester are between 21 and 27.
- From the II B.Tech I Semester to IV B.Tech I Semester, the student has the option of registering for additional theory courses from the latter semesters or dropping existing theory courses of the current semester within the course structure of the program. However the number of credits the student can register in a particular semester should not be below 21 (minimum) and should not exceed 27 (maximum).
- Grade points, based on percentage of marks awarded for each course will form the basis for calculation of SGPA (Semester Grade Point Average) and CGPA (Cumulative Grade Point Average).

All the registered credits will be considered for the calculation of final CGPA.

9. Course Enrollment and Registration

9.1 Each student, on admission shall be assigned to a Faculty Advisor (Mentor) who shall advice and counsel the student about the details of the academic programme and the choice of courses considering the student's academic background and career objectives.

9.2 Each student on admission shall register for all the courses prescribed in the curriculum in the student's first and second Semesters of study. The student shall enroll for the courses with the help of the student's Faculty Advisor (Mentor). The enrollment for the courses from II B.Tech I Semester to IV B.Tech I Semester will commence 10 days prior to the last instructional day of the preceding semester for registration process. If the student wishes, the student may drop or add courses (vide clause 8) within Ten days before commencement of the concerned semester and complete the registration process duly authorized by the Chairman, Board of studies of concern department.

9.3 If any student fails to register the courses in a semester, he shall undergo the courses as per the program structure.

9.4 After registering for a course, a student shall attend the classes, satisfy the attendance requirements, earn Continuous Assessment marks and appear for the Semester-end Examinations.

9.5 No course shall be offered by a Department unless a minimum of 40 students register for that course.

10. Massive Open Online Course (MOOC)

A Massive Open Online Course (MOOC) is an online course aimed at unlimited participation and open access via the web. MOOC is a model for delivering learning content online to any person who takes a course, with no limit on attendance.

- A student shall undergo a "Massive Open Online Course (MOOC)" for award of the degree besides other requirements.
- A student is offered this Online Course at the beginning of his III B.Tech I Semester of study and the course has to be completed by the end of III B.Tech II Semester. If the student fails to complete the course by the end of III B.Tech II Semester, it shall be treated as a backlog and needs to be completed before completion of the program for the award of the degree.
- The student shall confirm registration by enrolling the course within 10 days prior to the last instructional day of the II B. Tech. II Semester like other courses.
- The courses will be approved by the Chairman, Academic Council, SVEC based on the recommendations of the Chairman, Board of Studies of concerned program considering current needs.
- A student has a choice of registering for only one MOOC with the recommendation of Chairman, Board of studies of concerned program and duly approved by the Chairman, Academic Council, SVEC.

- The student shall undergo MOOC without disturbing the normal schedule of regular class work.
- One faculty member assigned by the Head of the Department shall be responsible for the periodic monitoring of the course implementation.
- No formal lectures shall be delivered by the faculty member assigned to the students.
- If any student wants to change the MOOC course already registered, he will be given the choice to register a new MOOC course in III B.Tech. only, with the recommendation of Chairman, Board of studies of concerned program and duly approved by the Chairman, Academic Council, SVEC.
- Finally, the performance of the student in the course shall be evaluated as stipulated by the course provider. A certificate will be issued on successful completion of the course by the course provider.
- The performance in the MOOC shall not be considered for the calculation of SGPA and CGPA of the student.
- The MOOC course shall be listed in the grade sheet of the student.

11. Break of Study from a Programme (Gap Year)

11.1 A student is permitted to go on break of study for a maximum period of two years either as two breaks of one year each or a single break of two years.

11.2 The student shall apply for break of study in advance, in any case, not later than the last date of the first assessment period in a semester. The application downloaded from website and duly filled by the student shall be submitted to the Head of the Department. In the case of start-up for incubation of idea only, the application for break of study shall be forwarded by the Head of the Department to the Principal, SVEC. A sub-committee appointed by the principal shall give recommendations for approval.

11.3 The students permitted to rejoin the programme after break of study shall be governed by the Curriculum and Regulations in force at the time of rejoining. The students rejoining in new regulations shall apply to the Principal, SVEC in the prescribed format through Head of the Department at the beginning of the readmitted semester itself for prescribing additional/equivalent courses, if any, from any semester of the regulations in-force, so as to bridge the curriculum in-force and the old curriculum.

11.4 The total period for completion of the programme reckoned from the commencement of the I B.Tech I Semester to which the student was admitted shall not exceed the maximum period specified in clause 5.2 irrespective of the period of break of study in order that the student may be eligible for the award of the degree (vide clause 18).

11.5 In case, if a student applies for break of study for one year and wishes to extend it for one more consecutive year, he shall be permitted with the prior approval of the Principal, SVEC through the concerned Head of the Department before beginning of the semester in which the student has taken break of study.

11.6 If a student has not reported to the department after approved period of break of study without any intimation, the student is treated as detained in that semester. Such students are eligible for readmission for the semester when offered next.

12. Examination System: All components in any Program of study shall be evaluated through internal evaluation and / or an external evaluation conducted as Semester-end examination.

Sl. No.	Course	Marks	Examination and Evaluation		Scheme of examination
1.	Theory	70	Semester-end examination of 3 hours duration (External evaluation)		The examination question paper in theory courses shall be for a maximum of 70 marks. The question paper shall be of descriptive type with 5 questions, taken one from each unit of syllabus, having internal choice and all 5 questions shall be answered. All questions carry equal marks.
		30	Mid-term Examination of 2 hours duration (Internal evaluation).		The question paper shall be of descriptive type with 4 essay type questions out of which 3 are to be answered and evaluated for 24 marks and also 6 short answer questions out of which all are to be answered and evaluated for 6 marks.
					Two mid-term examinations each for 30 marks are to be conducted. For a total of 30 marks, 75% of better one of the two and 25% of the other one are added and finalized. **Mid-I:** After first spell of instruction (I to II Units). **Mid-II**: After second spell of instruction (III to V Units).
2	Laboratory	50	Semester end Lab Examination for 3 hours duration (External evaluation)		50 marks are allotted for laboratory/drawing examination during semester end.
		50	30	Day-to-Day evaluation for Performance in laboratory experiments and Record. (Internal evaluation).	Two laboratory examinations, each of which includes Day-to-Day evaluation and Practical test, for 50 marks are to be evaluated. For a total of 50 marks 75% of better one of the two and 25% of the other one are added and finalized. **Laboratory examination-I:** Shall be conducted just before I mid-term examinations. **Laboratory examination-II:** Shall be conducted just before II mid-term examinations.
			20	Practical test (Internal evaluation).	
3	a) Seminar	100	Semester-end Examination		100 marks are allotted for Seminar during semester-end evaluation by the Seminar Evaluation Committees (**SECs**) as given in 12.2.1.
	b)Comprehensive Assessment	100	Semester-end Examination		Comprehensive Assessment shall be conducted as given in 12.2.2 as semester end evaluation for 100 marks.
4	Project Work	200	100	External evaluation	Semester end Project Viva-Voce Examination by Committee as detailed in 12.2.3 for 100 marks.
			100	Internal evaluation	Continuous evaluation by the Project Evaluation Committees (**PECs)** as detailed in 12.2.3 for 100 marks.

12.2 Seminar/Comprehensive Assessment /Project Work Evaluation:

12.2.1 For the seminar, the student shall collect information through literature survey on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the Department just before presentation. The report and the presentation shall be evaluated at the end of the semester by the Seminar Evaluation Committees (SECs), each consisting of concerned supervisor and two senior faculty members. The SECs are constituted by the Principal on the recommendations of the Head of the Department.

12.2.2 Comprehensive Assessment shall be conducted by the Department through (i) online with 50 objective questions for 50 marks and (ii) viva-voce for the remaining 50 marks, covering all the courses from I B.Tech I Semester to IV B.Tech I Semester. The viva-voce will be conducted by Comprehensive Assessment Committees (CACs), each consisting of three faculty members (out of whom at least two are seniors). The CACs are constituted by the Principal on the recommendations of the Head of the Department. The HODs of the respective Departments are given the responsibility of preparing question bank/question paper for conducting the online examination.

12.2.3 The project Viva-Voce examination shall be conducted by a Committee consisting of External examiner (nominated by the Chief Controller of Examinations), HOD and concerned Supervisor. The evaluation of project work shall be conducted at the end of the IV B.Tech II Semester. The Internal Evaluation shall be made by the Project Evaluation Committees (PECs), each consisting of concerned supervisor and two senior faculty members on the basis of two project reviews conducted on the topic of the project. The PECs are constituted by the Principal on the recommendations of the Head of the Department.

12.3. Eligibility to appear for the semester-end examination:

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

12.3.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee.

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

12.3.4 Students whose shortage of attendance is not condoned in any semester is not eligible to take their end examination of that semester and their registration shall stand cancelled.

12.3.5 A student shall not be promoted to the next semester unless he satisfies the attendance requirements of the current semester, as applicable. The student may seek readmission for the semester when offered next. He will not be allowed to register for the courses of the semester while he is in detention. A student detained due to shortage of attendance, will have to repeat that semester when offered next.

12.3.6 A stipulated fee shall be payable to the College towards condonation of shortage of attendance.

12.4. Evaluation: Following procedure governs the evaluation.

12.4.1. Marks for components evaluated internally by the faculty shall be submitted to the Controller of Examinations one week before the commencement of the End examinations. The marks for the internal evaluation components shall be added to the external evaluation marks secured in the Semester-end examinations, to arrive at total marks for any course in that semester.

12.4.2. Performance in all the courses is tabulated course-wise and shall be scrutinized by the Results Committee and moderation is applied if needed and course-wise marks are finalized. Total marks obtained in each course are converted into letter grades.

12.4.3. Student-wise tabulation shall be done and individual grade Sheet shall be generated and issued to the student.

12.5. Personal verification / Revaluation / Recounting:
Students shall be permitted for personal verification/request for recounting/ revaluation of the Semester-end 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 shall be issued a revised grade sheet. If there are no changes, the student shall be intimated the same through a notice.

12.6. Supplementary Examination:
In addition to the regular semester-end examinations conducted, the College may also schedule and conduct supplementary examinations for all the courses of other semesters when feasible for the benefit of students. Such of the candidates writing supplementary examinations may have to write more than one examination per day.

13. Academic Requirements for promotion/ completion of regular B.Tech Program of study:
The following academic requirements have to be satisfied in addition to the attendance requirements for promotion/ completion of regular B.Tech Program of study.

For students admitted into B.Tech. (Regular) Program:

13.1 A student shall be deemed to have satisfied the minimum academic requirements for each theory, laboratory course and project work, if he secures not less than 40% of marks in the semester-end examination and a minimum of 40% of marks in the sum total of the internal evaluation and Semester-end examination taken together. For the seminar and comprehensive Viva-Voce, he should secure not less than 40% of marks in the semester-end examination.

13.2 A student shall be promoted from second year to third year of Program of study only if he fulfills the academic requirement of securing 36 credits from

a. Two regular and one supplementary examinations of I B.Tech I Semester.

b. O ne regular and one supplementary examinations of I B.Tech II Semester.

c. One regular examination of II B.Tech I Semester.

Irrespective of whether or not the candidate appears for the semester-end examination as per the normal course of study.

13.3 A student shall be promoted from third year to fourth year of Program of study only if he fulfills the academic requirements of securing 60 credits from the following examinations,

a. Three regular and two supplementary examinations of I B.Tech I Semester.

b. Two regular and two supplementary examinations of I B.Tech II Semester.

c. Two regular and one supplementary examinations of II B.Tech I Semester.

d. One regular and one supplementary examinations of II B.Tech II Semester.

e. One regular examination of III B.Tech I Semester.

Irrespective of whether or not the candidate appears for the semester-end examination as per the normal course of study and in case of getting detained for want of credits by sections 13.2 and 13.3 above, the student may make up the credits through supplementary examinations.

13.4 A student shall register for all the 180 credits and earn all the 180 credits. Marks obtained in all the 180 credits shall be considered for the calculation of the DIVISION based on CGPA.

13.5 A student who fails to earn 180 credits as indicated in the course structure within eight academic years from the year of their admission shall forfeit his seat in B.Tech. Program and his admission stands cancelled.

For Lateral Entry Students (batches admitted from the academic year 2017-2018):

13.6 A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical course and project, if he secures not less than 40% of marks in the semester-end examination and a minimum of 40% of marks in the sum total of the internal evaluation and semester-end examination taken together. For the seminar and comprehensive Viva-Voce, he should secure not less than 40% of marks in the semester-end examination.

13.7 A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of securing 36 credits from the following examinations.

a. Two regular and one supplementary examinations of II B.Tech I Semester.

b. One regular and one supplementary examinations of II B.Tech II Semester.

c. One regular examination of III B.Tech I Semester.

Irrespective of whether or not the candidate appears for the semester-end examination as per the normal course of study and in case of getting detained for want of credits the student may make up the credits through supplementary examinations.

13.8 A student shall register for all 132 credits and earn all the 132 credits. Marks obtained in all the 132 credits shall be considered for the calculation of the DIVISION based on CGPA.

13.9 A student who fails to earn 132 credits as indicated in the course structure within six academic years from the year of their admission shall forfeit his seat in B.Tech Program and his admission stands cancelled.

14. 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 Program in earlier regulations (or) who have discontinued and wish to continue the Program are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent courses as and when courses are offered and they will be in the academic regulations into which they are presently readmitted.

A regular student has to satisfy all the eligibility requirements within the maximum stipulated period of eight years and a lateral entry student within six years for the award of B.Tech Degree.

15. Grades, Semester Grade Point Average and Cumulative Grade Point Average:

15.1. Grade System: After all the components and sub-components of any course (including laboratory courses) are evaluated, the final total marks obtained shall be converted into letter grades on a "10 point scale" as described below.

Grades conversion and Grade points attached

% of Marks obtained	Grade	Description of Grade	Grade Points (GP)
> = 95	O	Outstanding	10
> = 85 to < 95	S	Superior	9
> = 75 to < 85	A	Excellent	8
> = 65 to < 75	B	Very Good	7
> = 55 to < 65	C	Good	6
> = 45 to < 55	D	Fair	5
> = 40 to < 45	E	Pass	4
< 40	F	Fail	0
Not Appeared	N	Absent	0

Pass Marks: A student shall be declared to have passed theory course, laboratory course and project work if he secures minimum of 40% marks in external examination, and a minimum of 40% marks in the sum total of internal evaluation and external examination taken together. For the seminar and comprehensive Assessment, he shall be declared to have passed if he secures minimum of 40% of marks in the semester-end examination. Otherwise he shall be awarded fail grade - **F** in such a course irrespective of internal marks. **F** is considered as a fail grade indicating that the student has to pass the semester-end examination in that course in future and obtain a grade other than **F** and **N** for passing the course.

15.2. Semester Grade Point Average (SGPA): SGPA shall be calculated as given below on a "10 point scale" as an index of the student's performance at the end of each semester:

$$SGPA = \frac{\sum(C\ X\ GP)}{\sum C}$$

where C denotes the credits assigned to the courses undertaken in that semester and GP denotes the grade points earned by the student in the respective courses.

Note: SGPA is calculated only for the candidates who passed all the courses in that Semester.

15.3. Cumulative Grade Point Average (CGPA):

The CGPA for any student is awarded only when he completes the Program i.e., when the student passes in all the courses prescribed in the Program. The CGPA is computed on a 10 point scale as given below:

$$CGPA = \frac{\sum(C\ X\ GP)}{\sum C}$$

where C denotes the credits assigned to courses undertaken up to the end of the Program and GP denotes the grade points earned by the student in the respective courses.

16. **Grade Sheet:** A grade sheet (Marks Memorandum) shall be issued to each student indicating his performance in all courses registered in that semester indicating the **SGPA.**

17. **Consolidated Grade Sheet:** After successful completion of the entire Program of study, a Consolidated Grade Sheet containing performance of all academic years shall be issued as a final record. Duplicate Consolidated Grade Sheet will also be issued, if required, after payment of requisite fee.

18. **Award of Degree**: The Degree shall be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Ananthapuramu on the recommendations of the Chairman, Academic Council of SVEC (Autonomous).

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

- Registered and successfully completed all the components prescribed in the Program of study to which he is admitted.
- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of study within the stipulated time.
- Obtained CGPA greater than or equal to 4.0 (Minimum requirement for declaring as passed).
- Has no dues to the College, Hostel, Library etc. and to any other amenities provided by the College.
- No disciplinary action is pending against him.

18.2. **Award of Division:** Declaration of Division is based on CGPA.

Awarding of Division

CGPA	Division
> = 7.0	First Class with Distinction
> = 6.0 and < 7.0	First Class
> = 5.0 and < 6.0	Second Class
> = 4.0 and < 5.0	Pass Class

19. **Additional academic regulations:**

19.1 A student may appear for any number of supplementary examinations within the stipulated time to fulfill regulatory requirements for award of the degree.

19.2 In case of malpractice/improper conduct during the examinations, guidelines shall be followed as given in the Annexure-I.

19.3 Courses such as Project, Seminar and Comprehensive Assessment may be repeated only by registering in supplementary examinations.

19.4 When a student is absent for any examination (Mid-term or Semester-end) he shall be awarded zero marks in that component (course) and grading will be done accordingly.

19.5 When a component is cancelled as a penalty, he shall be awarded zero marks in that component.

20. Withholding of Results:

If the candidate has not paid dues to the College/University (or) if any case of indiscipline is pending against him, the result of the candidate shall be withheld and he will not be allowed/ promoted to the next higher semester.

21. Amendments to regulations:

The Academic Council of SVEC (Autonomous) 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., with the recommendations of the concerned Board(s) of Studies.

22. Attendance for student development activity periods indicated in the class time tables shall be considered as in the case of a regular course for calculation of overall percentage of attendance in a semester.

23. General:

The words such as "he", "him", "his" and "himself" shall be understood to include all students irrespective of gender connotation.

Note: Failure to read and understand the regulations is not an excuse.

Annexure-I

GUIDE LINES FOR DISCIPLINARY ACTION FOR MALPRACTICES / IMPROPER CONDUCT IN EXAMINATIONS

Rule No.	Nature of Malpractices/ Improper conduct	Punishment
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the course of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the course of the examination)	Expulsion from the examination hall and cancellation of the performance in that course only.

(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that course only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the course of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that course and all other courses the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the courses of that Semester. The Hall Ticket of the candidate is to be cancelled.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred for four consecutive semesters from class work and all Semester-end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the courses of the examination (including labs and project work) already appeared and shall not be allowed to appear for examinations of the remaining courses of that semester. The candidate is also debarred for four consecutive semesters from class work and all Semester-end examinations, if his involvement is established. Otherwise, The candidate is debarred for two consecutive semesters from class work and all Semester-end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.

4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that course and all the other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that semester. The candidate is also debarred for two consecutive semesters from class work and all Semester-end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that course only.
6.	Refuses to obey the orders of the Chief Controller of Examinations/Controller of Examinations/any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the Controller of Examinations or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the Controller of Examinations, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that course and all other courses the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the courses of that semester. If the candidate physically assaults the invigilator/Controller of the Examinations, then the candidate is also debarred and forfeits his/her seat. In case of outsiders, they will be handed over to the police and a police case is registered against them.

7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that course and all the other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that semester. The candidate is also debarred for two consecutive semesters from class work and all Semester-end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that course and all other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that semester. The candidate is also debarred and forfeits the seat.

Note: Whenever the performance of a student is cancelled in any course(s) due to Malpractice, he has to register for Semester-end Examinations in that course(s) consequently and has to fulfill all the norms required for the award of Degree.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2016-2017)

ELECTRONICS AND INSTRUMENTATION ENGINEERING

I B.Tech. (I Semester)

S. No.	Course code	Course Title	Contact Periods / Week				Credits (C)	Scheme of Examination Max. Marks		
			L	T	P	Total		Internal Marks	External Marks	Total Marks
I Year - I Semester										
1.	**16BT1BS02**	Engineering Physics	3	1	0	4	3	30	70	100
2.	**16BT1BS03**	Matrices and Numerical Methods	3	1	0	4	3	30	70	100
3.	**16BT1BS04**	Multi-Variable calculus and Differential Equations	3	1	0	4	3	30	70	100
4.	**16BT10241**	Network Analysis	4	1	0	5	4	30	70	100
5.	**16BT10501**	Programming in C	3	1	0	4	3	30	70	100
6.	**16BT1BS32**	Engineering Physics Lab	0	0	3	3	2	50	50	100
7.	**16BT10232**	Electrical and Electronics Workshop Practice	0	0	3	3	2	50	50	100
8.	**16BT10251**	Network Analysis Lab	0	0	3	3	2	50	50	100
9.	**16BT10531**	Programming in C Lab	0	0	3	3	2	50	50	100
		Total	**16**	**5**	**12**	**33**	**24**	**350**	**550**	**900**

I B.Tech. (II Semester)

S. No.	Course code	Course Title	Contact Periods / Week				Credits (C)	Scheme of Examination Max. Marks		
			L	T	P	Total		Internal Marks	External Marks	Total Marks
I Year - II Semester										
1.	**16BT1HS01**	Technical English	3	1	0	4	3	30	70	100
2.	**16BT1BS01**	Engineering Chemistry	3	1	0	4	3	30	70	100
3.	**16BT2BS01**	Transformation Techniques and Partial Differential Equations	3	1	0	4	3	30	70	100
4.	**16BT20401**	Electronic Devices and Circuits	3	1	0	4	3	30	70	100
5.	**16BT20541**	Foundations of Data Structures	3	1	0	4	3	30	70	100
6.	**16BT1HS31**	English Language Lab	0	0	3	3	2	50	50	100
7.	**16BT1BS31**	Engineering Chemistry Lab	0	0	3	3	2	50	50	100
8.	**16BT10331**	Computer Aided Engineering Drawing	0	1	6	7	3	50	50	100
9.	**16BT20551**	Foundations of Data structures Lab	0	0	3	3	2	50	50	100
		Total	**15**	**6**	**15**	**36**	**24**	**350**	**550**	**900**

I B. Tech. - I Semester

(16BT1BS02) ENGINEERING PHYSICS

(Common to ECE, EEE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	*70*	*100*	*3*	*1*	--	*3*

PRE-REQUISITES: Intermediate / senior secondary Physics

COURSE DESCRIPTION:

Lasers; optical fibers; principles of quantum mechanics; band theory of solids; semiconductors; dielectric properties of materials; acoustics of buildings; superconductors; crystallography and nanomaterials.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Acquire basic knowledge of lasers, optical fibers, quantum mechanics, dielectrics, semiconductors, and superconductors, acoustic of buildings, crystallography and nanomaterials.
2: Analyze the construction and working of various laser systems, semiconductor devices, various types of optical fibers and its communication system and nano materials properties.
3: Gain skills in designing lasers, optical fiber cable, semiconductor devices, acoustically good halls and nanomaterials.
4: Develop problem solving skills in engineering context.
5: Use relevant techniques for assessing ball milling, pulsed laser deposition, p-n junction and Laser

DETAILED SYLLABUS:

UNIT I - LASERS AND FIBER OPTICS (11periods)

Lasers: Introduction, characteristics of lasers, spontaneous and stimulated emission of radiation, Einstein's coefficients - condition for amplification, population inversion, Nd:YAG laser, Helium-Neon laser, semiconductor laser and applications of lasers.

Fiber optics: Introduction, principle of optical fiber, acceptance angle, acceptance cone and numerical aperture, classification of optical fibers, optical fiber communication system and applications of optical fibers.

UNIT II – PRINCIPLES OF QUANTUM MECHANICS AND BAND THEORY OF SOLIDS (07 p*eriods*)

Principles of Quantum Mechanics: Introduction, de-Broglie's hypothesis, Schrödinger's one dimensional wave equation (time independent), significance of wave function, particle in a one dimensional potential box, Fermi-Dirac distribution and effect of temperature (qualitative treatment).

Band Theory of Solids: Electron in a periodic potential, Kronig-Penney model (qualitative treatment), origin of energy bands formation in solids, distinction between conductors, semiconductors and insulators based on band theory.

UNIT III – SEMICONDUCTORS AND DIELECTRIC PROPERTIES OF MATERIALS (13 periods)

Semiconductors: Introduction, types of semiconductors, intrinsic carrier concentration, electrical conductivity in semiconductors, drift and diffusion currents, Einstein's relation, Hall effect and its applications, direct and indirect band gap semiconductors, p-n junction, energy band diagram of p-n diode, LED, photo diode and Solar cell.

Dielectric Properties of Materials: Introduction, dielectric constant, electronic, ionic and orientation polarizations (qualitative treatment), local field, frequency dependence of polarizability (qualitative treatment), ferroelectricity.

UNIT IV – ACOUSTICS OF BUILDINGS AND SUPERCONDUCTIVITY (07 periods)

Acoustics of Buildings: Introduction, basic requirement of acoustically good hall, reverberation and time of reverberation, Sabine's formula for reverberation time (qualitative treatment), absorption coefficient of sound and its measurement, factors affecting the architectural acoustics and their remedies.

Superconductivity: Introduction, General properties - Meissner effect, penetration depth, Type-I and Type-II superconductors, flux quantization, Josephson effects, BCS theory (qualitative treatment), applications of superconductors.

UNIT V – CRYSTALLOGRAPHY AND NANOMATERIALS (07 p*eriods*)

Crystallography: Introduction, crystal planes, crystal directions and Miller indices, separation between successive (hkl) planes, X-ray diffraction by crystal planes, Bragg's law-powder method.

Nanomaterials: Introduction, principles of nanomaterials, properties of nanomaterials, synthesis of nanomaterials by ball milling and pulsed laser deposition and applications of nanomaterials.

Total Periods: 45

TEXT BOOK:

1. P. K. Palaniswamy, ***Engineering Physics***, Scitech Publications India Private Limited, 2nd Edition, 2009

REFERENCE BOOKS:

1. Dr. S. Mani Naidu, ***Engineering Physics***, Pearson Education, 1st Edition, 2013.
2. M.N. Avadhanulu, P.G.Kshirsagar, ***A textbook of Engineering Physics***, S.Chand & Company Ltd. Revised edition 2014.
3. K. Thyagarajan, ***Engineering Physics-I***, McGraw-Hill Education (India) Pvt. Ltd. 2015.

I B. Tech. – I Semester

(16BT1BS03) MATRICES AND NUMERICAL METHODS

(Common to all Branches)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	*70*	*100*	*3*	*1*	*--*	*3*

PRE-REQUISITES: Intermediate /Senior secondary mathematics

COURSE DESCRIPTION: Fundamentals of matrix theory; numerical solutions of equations, curve fitting; interpolation; numerical differentiation and integration; numerical solutions of ordinary differential equations.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Acquire basic **knowledge** in
   (a) Finding the rank of matrices and analyzing them.
   (b) Solving algebraic and transcendental equations by various numerical methods.
   (c) Fitting of various types of curves to the experimental data.
   (d) Estimating the missing data through interpolation methods.
   (e) Identification of errors in the experimental data
   (f) Finding the values of derivatives and integrals through various numerical methods.
   (g) Solving differential equations numerically when analytical methods fail.

2: Develop skills in **analyzing** the
   (a) methods of interpolating a given data
   (b) properties of interpolating polynomials and derive conclusions
   (c) properties of curves of best fit to the given data
   (d) algebraic and transcendental equations through their solutions
   (e) properties of functions through numerical differentiation and integration
   (f) properties of numerical solutions of differential equations

3: Develop skills in **designing** mathematical models for
   (a) Fitting geometrical curves to the given data
   (b) Solving differential equations
   (c) Constructing polynomials to the given data and drawing inferences.

4: Develop numerical skills in **solving the problems** involving
   (a) Systems of linear equations
   (b) Fitting of polynomials and different types of equations to the experimental data
   (c) Derivatives and integrals
   (d) Ordinary differential equations

5: Use relevant numerical **techniques** for
   (a) Diagonalising the matrices of quadratic forms
   (b) Interpolation of data and fitting interpolation polynomials
   (c) Fitting of different types of curves to experimental data
   (d) obtaining derivatives of required order for given experimental data
   (e) Expressing the functions as sum of partial fractions

DETAILED SYLLABUS:

UNIT–I : MATRICES (11 periods)

Rank of a matrix, echelon form, normal form, inverse of a matrix by elementary row operations. Solutions of linear system of equations. Eigen values, Eigen vectors and properties (without proof), Diagonalization. Quadratic form (QF), reductions to canonical form using orthogonal transformation and nature of QF.

UNIT-II NUMERICAL SOLUTIONS OF EQUATIONS AND CURVE FITTING (8 periods)

Solutions of Algebraic and Transcendental equations by bisection method, Regula-Falsi method, Newton – Raphson's method. Curve fitting by the principle of least squares, fitting of a straight line, parabola and exponential curves.

UNIT- III INTERPOLATION (8 periods)

Interpolation, difference operators and their relationships, Newton's forward and backward formulae, Lagrange's interpolation formula. Partial fractions using Lagrange's interpolation formula.

UNIT-IV NUMERICAL DIFFERENTIATION AND INTEGRATION (8 periods)

Numerical differentiation using Newton's forward and backward formulae. Numerical integration using Trapezoidal rule, Simpson's $1/3^{rd}$ rule and $3/8^{th}$ rule.

UNIT- V NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS (10 periods)

Numerical solutions of first order Initial value problems using Taylor series method, Euler's method , modified Euler's method, Runge – Kutta method (4 thorder only) and Milne's predictor – corrector method.

Total no. of periods: 45

TEXT BOOK:

1. T.K.V. Iyenger, B. Krishna Gandhi, S.Ranganadham and M.V.S.S.N.Prasad, ***Mathematical Methods***, S.Chand and Company, 8/e, 2013

REFERENCE BOOKS:

1. B.S. Grewal, ***Higher engineering mathematics***, Khanna Publishers, 42nd Edition. 2012
2. S.S.Sastry, ***Introductory methods of Numerical Analysis***, Prentice Hall of India, 5/e, 2013

I B. Tech. - I Semester

(16BT1BS04) MULTI - VARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS

(Common to all Branches)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	*70*	*100*	*3*	*1*	--	*3*

PRE-REQUISITES: Intermediate /Senior secondary mathematics

COURSE DESCRIPTION: First order differential equations; higher order linear differential equations; functions of several variables; applications of integration; multiple integrals; vector calculus.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Acquire knowledge in
   (a) Higher order Differential equations
   (b) Maximum and minimum values for the functions of several variables
   (c) Double and triple integrals
   (d) Differentiation and integration of vector functions.
   (e) Line and surface volume
   (f) transforming integrals from three dimensional surfaces and volumes on to plane surfaces

2: Develop skills in analyzing the
   (a) methods for differential equation for obtaining appropriate solutions,
   (b) Properties of oscillatory electrical circuits and heat transfer in engineering systems
   (c) The variations in the properties of functions near their stationary values
   (d) Flow patterns of fluids, electrical and magnetic flux and related aspects

3: Develop skills in designing mathematical models for
   (a) R-C and L-R-C oscillatory electrical circuits
   (b) Heat transfer and Newton's law of cooling
   (c) Engineering concepts involving lengths of curves and areas of planes, Flux across surfaces

4: Develop analytical skills in solving the problems involving
(a) Newton's law of cooling
(b) non homogeneous linear differential equations
(c) maximum and minimum values for the functions
(d) lengths of curves, areas of surfaces and volumes of solids in engineering
(e) transformation of integrals from three dimensional surfaces and volumes on to plane surfaces

5: Use relevant mathematical techniques for evaluating
(a) various types of particular integrals in differential equations
(b) stationary values for multi variable functions
(c) multiple integrals in change of variables
(d) integrations of vector functions.

DETAILED SYLLABUS:

UNIT-I: FIRST ORDER DIFFERENTIAL EQUATIONS (6 periods)

Linear and Bernoulli type, exact equations and reducible to exact. Orthogonal trajectories (Both Cartesian and polar forms). Newton's law of cooling.

UNIT II: HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS (9 periods)

Method for solution of linear equations- Differential operator *D*, Solution of second order linear homogeneous equations with constant coefficients, Solution of Higher order homogeneous linear equations with constant coefficients, **Solution of Non homogeneous linear equations**-Operator methods for finding particular integrals- for cases – e^{ax}, sin ax, cos ax, x^n, e^{ax} V(x), xV(x). Method of Variation of parameters. Applications to oscillatory electrical circuits.

UNIT-III: FUNCTIONS OF SEVERAL VARIABLES (8 periods)

Functions of Two Variables: Limits, Continuity; **Partial Derivatives**: Total Differential and Derivatives, Jacobian, Functional dependence, Taylor's Theorem, maxima and minima of functions of two variables with and without constraints – Lagrange's method of undetermined multipliers.

UNIT-IV: APPLICATIONS OF INTEGRATION AND MULTIPLE INTEGRALS (10 periods)

Applications of integration to – lengths of curves, areas of surfaces of revolution, Double and Triple integrals – change of order of integration, change of variables in integrals. Area enclosed by plane curves, volumes of solids.

UNIT-V: VECTOR CALCULUS (12 periods)

Vector differentiation: Gradient of a scalar field and Directional Derivative, Divergence and Curl of a Vector field

Line integrals: Line integrals independent of path – work done.

Surface area and Surface Integrals: Surface Area, Surface Integrals, Flux across a surface.

Green's Theorem: Green's Theorem (without proof)- verification- applications

Gauss Divergence Theorem and Stoke's Theorem: Gauss Divergence theorem (without proof), Stokes's Theorem (without proof) –verifications and applications.

Total no. of periods: 45

TEXT BOOK:

1. T.K.V. Iyengar, B. Krishna Gandhi,S.Ranganatham and M.V.S.S.N. Prasad, ***Engineering Mathematics, Vol-1***, S. Chand &Company, 13/e, 2014

REFERENCE BOOKS:

1. Grewal, B.S., ***Higher engineering mathematics***,Khanna publishers, Delhi, 42/e. 2012.
2. Kreyszig, E., ***Advanced Engineering Mathematics***,John Wiley and Sons, Inc.,9/e.2012.

I B. Tech. - I Semester

(16BT10241) **NETWORK ANALYSIS**

(Common to ECE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	4	1	0	4

PRE-REQUISITES: --

COURSE DESCRIPTION: Basic concepts of electric circuits; Voltage - Current relationship of basic circuit elements; Mesh and Nodal analysis; Network theorems; AC circuits; Two-port network parameters; Transient analysis.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Demonstrate knowledge in
- voltage and current relationships for various electric elements.
- network reduction techniques.
- concepts of AC fundamentals and single phase circuits.
- concepts of two-port networks.
- various network theorems.
- transient behavior of the circuits.

2: Analyze
- a circuit using conventional, mesh and nodal concepts.
- a two-port network for various network parameters.
- various types of two-port networks.
- the transient behavior of the circuits.

3: Design circuits to meet the required specifications

4: Evaluate
- electrical circuits for voltage, current and power using conventional circuit analysis methods and network theorems.
- transient response.
- two-port networks.

DETAILED SYLLABUS:

UNIT-I: INTRODUCTION TO ELECTRICAL CIRCUITS **(12 Periods)**

Concepts of charge, current, voltage, power, circuit elements, Ohm's law, Kirchoff's Laws, Network reduction techniques, voltage and current division rules, Series-Parallel circuits, Star-Delta and Delta-Star transformations, Source transformation, nodal analysis, mesh analysis- Problems.

UNIT-II: SINGLE PHASE AC CIRCUITS (12 Periods)

Introduction to AC quantities and basic definitions: Cycle, Time period, Frequency, Amplitude, determination of Average value, RMS value, Form factor and Peak factor for different alternating waveforms, phasor notation, phase and phase difference, phase relation in R, L, C circuits, series and parallel circuits, impedance and power triangle, power factor. Series and Parallel resonance, Quality factor and bandwidth-Problems.

UNIT-III: NETWORK THEOREMS (10 Periods)

Superposition, Thevenin's, Norton's, Maximum power transfer, Tellegen's, Millman's, Reciprocity, Compensation theorems for D.C. and sinusoidal excitation- Problems.

UNIT-IV: TWO-PORT NETWORKS (10 Periods)

Impedance parameters, admittance parameters, transmission (ABCD) parameters, hybrid parameters, conversion of one parameter to another, conditions for reciprocity and symmetry, interconnection of two-port networks in series, parallel and cascaded configurations - Problems.

UNIT-V: TRANSIENT ANALYSIS (10 Periods)

Transient response of R-L, R-C and R-L-C for DC excitation and Sinusoidal excitation - Solution by using Differential equation and Laplace Transforms method - Problems.

Total Periods: 54

TEXT BOOKS:

1. Sudhakar, S.P.Shyam Mohan, Circuits and Network analysis and synthesis, 5th edition, Tata McGraw Hill publishing company Ltd., New Delhi, 2007.
2. W. H. Hayt, J. E. Kemmerly, S. M. Durbin, Engineering Circuit Analysis, 6th edition, Tata McGraw Hill publishing company Ltd., New Delhi, 2008.

REFERENCE BOOKS:

1. M.E. Van Valkenberg, Network Analysis, Pearson Publications, 3rd edition, New Delhi 2006.
2. A.Chakrabarthi, Circuit Theory (analysis and synthesis), 6th edition, Dhanpat Rai & Co, New Delhi, 2014.

I B. Tech. - I Semester

(16BT10501) **PROGRAMMING IN C**

(Common to all Branches)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	*70*	*100*	*3*	*1*	-	*3*

PRE-REQUISITES: NIL

COURSE DESCRIPTION:

Program design; Operators and Expressions; Data Input and Output; Control Statements; Functions; Arrays; Strings; Pointers; Structures & Unions and File handling Techniques;

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Demonstrate knowledge in:
- o Elements of C Language
- o Selection and Repetition statements.
- o Arrays, Strings and Functional statements.
- o Derived data types, Files and Pointers

2: Analyze complex engineering problems to develop suitable solutions

3: Design algorithms for specified engineering problems

4: Use appropriate 'C' language constructs for solving engineering problems

5: Write programs using 'C' language to implement algorithms

DETAILED SYLLABUS:

UNIT I – INTRODUCTION TO C PROGRAMMING, OPERATORS & EXPRESSIONS (08 periods)

Introduction to C Programming: The C Character set, Writing First Program of C, Identifiers and Keywords, Data types, Constants, Variables and Arrays, Declarations, Expressions, Statements and Symbolic Constants.

Operators and Expressions: Arithmetic Operators, Unary Operators, Relational and Logical Operators, Assignment Operators, the Conditional Operators.

UNIT II – DATA INPUT AND OUTPUT & CONTROL STATEMENTS (08 periods)

Data Input and Output: Single Character Input and Output, Input Data & Output data, The gets and puts Function.

Control Statements: Branching: The if-else Statement, Looping: The while Statement, More Looping: The do-while Statement, Still More Looping: The for Statement, Nested Control Statement, The switch Statement, The break & continue Statements, The goto Statement.

UNIT III – FUNCTIONS, PROGRAM STRUCTURES & ARRAYS (11 p*eriods*)

Functions: A Brief Overview, Defining a Function, Accessing a Function, Function Prototypes, Parsing Argument to a Function, Recursion.

Program Structure: Storage Classes, Automatic Variables, External (Global) Variables, Static Variables, Multi file Programs,

Arrays: Defining an Array, Processing an Array, Processing Array to function, Multidimensional Arrays. Linear search, Binary search, Fibonacci search, Bubble sort and Insertion sort

UNIT IV – STRINGS & POINTERS (09 periods)

Strings: Defining a String, NULL Character, Initialization of Strings, Reading and Writing a String, Processing a Strings, Character Arithmetic, Searching and Sorting of Strings, Library Functions for Strings.

Pointers: Pointer Declaration, Passing Pointers to a Function, Pointers and One-dimensional Arrays, Dynamic Memory Allocation, Operations on Pointers, Pointers and Multidimensional Arrays, Arrays of Pointers.

UNIT V – STRUCTURES AND UNIONS & FILE HANDLING (09 periods)

Structures and Unions: Defining a Structure, Processing a Structure, User-Defined Data types (typedef), Structures and Pointers, Passing Structures to Function, Self –Referential Structures, Unions

File Handling: Files introduction, Opening and Closing a Data File, Reading and Writing a Data File, Processing a Data File, Unformatted Data File, Concept of Binary Files, Accessing the File Randomly.

Total Periods: *45*

TEXT BOOK:

1. Byron Gottfried and Jitender Kumar C "*Programming with C*," Third Edition, McGraw Hill Education (India) Pvt, Ltd, New Delhi, 2016.

REFERENCE BOOKS:

1. PradipDey and Manas Ghosh, *"Programming in C",* Second Edition, Oxford University Press, NewDelhi, 2007.
2. E. Balagurusamy, "*Programming in C",* Seventh Edition, Mc Graw Hill Education (India) Pvt, Ltd, New Delhi, 2014.

I B. Tech. I-Semester

(16BT1BS32) ENGINEERING PHYSICS LAB

(Common to ECE, EEE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	0	0	3	2

PRE-REQUISITES: Intermediate / senior secondary Physics.

COURSE DESCRIPTION:

Characteristics of p-n junction diode, Photodiode, LED, and semiconductor laser diode. Experimental determination of carrier concentration and energy gap of a semiconductor material, wave length of a laser source, size of fine particle, numerical aperture and acceptance angle of optical fiber. Determination of frequency of electrically vibrating tuning fork and A.C source using A.C sonometer, magnetic field along axial line of a current carrying coil and rigidity modulus of material of a wire using torsional pendulum.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Acquire basic knowledge about semiconductor materials, magnetic materials and lasers.
2: Acquire analytical skills in the estimation of carrier concentration of semiconductor materials and characterization of p-n junction.
3: Develop skills in designing electronic circuits using semiconductor components.
4: Acquire skills to use instrumental techniques in A.C sonometer and Melde's experiment.
5: Apply diffraction techniques for determination of size of tiny particles and wave length of lasers.

ENGINEERING PHYSICS LAB

Conduct a minimum of any **Ten** of the following experiments.

1. Determination of wavelength of a laser source using Diffraction Grating.
2. Determination of particle size by using a laser source.
3. Determination of Numerical aperture and acceptance angle of an optical fiber.
4. Melde's experiment - transverse & longitudinal modes.

5. Magnetic field along the axis of a current carrying coil- Stewart and Gee's method.
6. Calculation of A.C frequency using sonometer.
7. I-V Characteristics of a p-n Junction diode.
8. Energy gap of a material of a p-n Junction.
9. Characteristics of LED source.
10. Characteristics of Photo diode.
11. Hall Effect.
12. Determination of rigidity modulus of the material of the wire using torsional pendulum.

I B. Tech. - I Semester

(16BT10232) ELECTRICAL AND ELECTRONICS WORKSHOP PRACTICE

(Common to ECE, EEE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	0	0	3	2

PRE-REQUISITES: NIL

COURSE DESCRIPTION: Identification and specifications of various Electric and Electronic devices; analysis of various series, parallel and series-parallel electrical circuits; develop various electrical circuits for domestic and industrial applications.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Demonstrate knowledge on various Electrical and Electronic Devices.
2: Analyze various series and parallel electrical circuits.
3: Design and develop various electrical circuits for domestic and industrial applications.
4: Function effectively as individual and as a member in a team.
5: Communicate effectively both oral and written forms

DETAILED SYLLABUS:

PART A: (Demonstration)

1. Identification and Specifications of R, L, C Components (Colour Codes), Potentiometers, Switches (SPST, DPST and DPI), Gang Condensers, Relays, Bread Boards, PCBs, Fuses, MCBs, Earthing and Electrical Wiring accessories.
2. Identification and Specifications of Active Devices: Diodes, BJTs, Low-power JFETs, MOSFETs, Power Transistors, LEDs, LCDs, Optoelectronic Devices, SCR, UJT, DIACs, TRIACs, Linear and Digital ICs.
3. Study the operation of
   - Multimeter (Analog and Digital)
   - Function Generator
   - Regulated Power Supplies
   - CRO.

PART-B:

1. Measurement of Electrical Quantities (AC & DC) using: Voltmeter, Ammeter and Wattmeter.
2. Measurement of Resistivity of a conducting wire.
3. Circuit with one lamp controlled by one switch and provision of 2-pin or 3-pin socket PVC surface conduit system.
4. Circuit with two lamps controlled by two switches with PVC surface conduit system.
5. Circuit for Stair case wiring and Godown wiring.
6. Circuit connection for a Fluorescent tube
7. Solder simple electronic circuits.
8. B-H curve of a Magnetic material
9. I-V and P-V characteristics of a Solar panel
10. Design and Fabrication of a single-phase transformer
11. PCB preparation and design of a circuit on a PCB

I B. Tech. - I Semester

(16BT10251) NETWORK ANALYSIS LAB

(Common to ECE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	0	0	3	2

PRE-REQUISITES: NIL

COURSE DESCRIPTION: Verification of KVL, KCL and network theorems; analysis of AC and DC circuits; determination of resonant frequency in series and parallel RLC circuits; evaluation of transients

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Demonstrate knowledge in
- Identification of various circuit elements and their values.
- Concepts of electric circuits and two-port networks.

2: Analyze and relate physical observations and measurements in electric circuits to theoretical perception.

3: Design circuit parameters to meet the required specifications.

4: Demonstrate skills in evaluating and interpret
- Various circuit parameters using conventional and network theorems
- Network parameters

5: Function effectively as individual and as a member in a team.

6: Communicate effectively in oral format and prepare laboratory reports.

LIST OF EXPERIMENTS:

Any TEN experiments are to be conducted

1. Verification of KVL and KCL.
2. Mesh and Nodal analysis.
3. Series and Parallel resonance.
4. Phasor analysis of RL, RC and RLC circuits.
5. Measurement of active and reactive power in a single phase circuit.
6. Steady state response of series RL and RC circuits.
7. Two-port network parameters.
8. Verification of Superposition and Reciprocity theorems.
9. Verification of Thevenin's and Norton's theorem.
10. Verification of Maximum Power transfer theorem for DC and AC excitations.
11. Verification of Millmann's and compensation theorem.
12. Transient response of RL, RC and RLC circuits.

I B. Tech. - I Semester

(16BT10531) **PROGRAMMING IN C LAB**

(Common to all Branches)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	0	0	3	2

PRE-REQUISITES:-

A course on "Programming in C"

COURSE DESCRIPTION:

Hands on practice in developing and executing simple programs using C Programming constructs– Conditional statements, Loops, Arrays, Strings, Functions, Structures, Pointers and Functions.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Demonstrate practical knowledge of using C language constructs:
   - Selection and Repetition statements.
   - Arrays, Strings and Functional statements.
   - Derived data types, Files and Pointers

2: Analyze problems to develop suitable algorithmic solutions

3: Design Solutions for specified engineering problems

4: Use appropriate 'C' language constructs for solving engineering problems

5: Implement and execute programs using 'C' language

6: Document programs and communicate effectively while conducting Professional transactions.

List of Exercises:

1. a. Let a and b are two integer variables whose values are 10 and 13 respectively. Write a program to evaluate the following arithmetic expressions.
   i) a + b ii) a–b iii) a * b iv) a/b v) a % b

   b. Write a program to evaluate the following algebraic expressions after reading necessary values from keyword.
   i) $(ax + b)/(ax – b)$
   ii) $2.5 \log x + \text{Cos } 32^0 + | x^2 + y^2|$
   iii) $x^5 + 10 x^4 + 8$ and $x^3 + 4 x + 2$
   iv) ae^{kt}

2. a. Mr. Gupta deposited Rs.1000 in a bank. The bank gives simple interest at the rate of 15% per annum. Write a program to determine the amount in Mr. Gupta's account at the end of 5 years. (Use the formula I = P T R / 100)

b. A cashier has currency notes of denominations Rs.10, Rs. 50 and Rs. 100. If the amount to be withdrawn is input in hundreds, find the total number of notes of each denomination the cashier will have to give to the withdrawer.

c. In a town, the percentage of men is 52. The percentage of total literacy is 48.If total percentage of literate men is 35 of the total population; write a program to find the total number of illiterate men and women if the population of the town is 8000.

3. a. Write a program that prints the given 3 integers in ascending order using if - else.

b. Write a program to calculate commission for the input value of sales amount.

Commission is calculated as per the following rules:

i) Commission is NIL for sales amount Rs. 5000.

ii) Commission is 2% for sales when sales amount is >Rs. 5000 and <= Rs. 10000.

iii) Commission is 5% for sales amount >Rs. 10000.

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

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

4. a. If cost price and selling price of an item is input through the keyboard, write program to determine whether the seller has made profit or incurred loss. Also determine how much profit or loss he incurred in percentage.

b. An insurance company calculates premium as follows:

i. If a person's health is excellent and the person is between 25 and 35 years of age and lives in a city and is a male then premium is Rs.4 per thousand and the policy amount cannot exceed Rs.2 lakhs.

ii. If a person satisfies all the above conditions and is female then the premium is Rs.3 per thousand and the policy amount cannot exceed Rs.1 lakh.

iii. If a person's health is poor and the person is between 25 and 35 years of age and lives in a village and is a male then premium is Rs.6 per thousand and the policy cannot exceed Rs. 10000.

iv. In all other cases the person is not insured.

Write a program to determine whether the person should be insured or not, his/her premium rate and maximum amount for which he/she can be insured.

5. a. Write a program, which takes two integer operands and one operator as input from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, %. Use switch statement)

b. Write a program to find the grace marks for a student using switch. The user should enter the class obtained by the student and the number of subjects he has failed in. Use the following rules:

i. If the student gets first class and the number of subjects failed is >3, then no grace marks are awarded. If the number of subjects failed is less than or equal to '3' then the grace is 5 marks per subject.

ii. If the student gets second class and the number of subjects failed in is >2, then no grace marks are awarded. If the number of subjects failed in less than or equal to '3' then the grace is 4 marks per subject.

iii. If the student gets third class and the number of subjects failed in is >1, then no grace marks are awarded. If the number of subjects failed in is equal to '1' then the grace is 5 marks per subject.

6. a. Write a program to find the sum of individual digits of a positive integer.

b. A Fibonacci sequence is defined as follows:

The first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a program to generate the first N terms of the sequence.

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

7. a. Write a program to find the largest and smallest number in a given list of integers.

b. Write a program to perform the following:

i. Addition of two matrices.

ii. Multiplication of two matrices.

8. a. Write a program that uses functions to perform the following operations:
   i. To insert a sub-string in main string at a specified position.
   ii. To delete N characters from a given string from a specified position.
   b. Write a program to determine whether the given string is palindrome or not.
   c. Write a program to display the position or index in the main string S where the sub string T begins. Display -1 if S does not contain T.
   d. Write a program to count the number of lines, words and characters in a given text.
9. a. Write a program to read list of student names and perform the following operations using functions.
   i. to print list of names
   ii. to sort them in ascending order
   iii. to print the list after sorting.
   b. Write a menu driven program to read list of student names and perform the following operations using array of character pointers.
   i. to insert a student name
   ii. to delete a name
   iii. to print the name
10. Write a program that uses functions to perform the following operations:
   i. Reading a complex number
   ii. Writing a complex number
   iii. Addition of two complex numbers
   iv. Multiplication of two complex numbers
   (**Note:** Represent complex number using a structure.)
11. a. Write a program to accept the elements of the structure as:
   Employee-name,Basic pay
   Display the same structure along with the DA, CCA and Gross salary for 5 employees.
   Note: DA=51% of Basic pay, CCA=Rs.100.consolidated.
   b. Define a structure to store employee's data with the following specifications:
   Employee-Number, Employee-Name, Basic pay, Date of Joining
   i. Write a function to store 10 employee details.
   ii. Write a function to implement the following rules while revising the basic pay.

If Basic pay<=Rs.5000 then increase it by 15%.

If Basic pay> Rs.5000 and <=Rs.25000 then it increase by 10%.

If Basic pay>Rs.25000 then there is no change in basic pay.

Write a function to print the details of employees who have completed 20 years of service from the date of joining.

12. a. Write a program which copies one 'text file' to another 'text file'.

    b.Write a program to reverse the first N characters of a given text file.

Note: The file name and N are specified through command line.

13. Write a program to print the output by giving the Customer_ID as an input.

REFERENCE BOOKS:

1. Byron Gottfried and Jitender Kumar C, "Programming with C," Third Edition, McGraw Hill Education(India) Pvt. ltd, New Delhi, 2016.
2. Pradip Dey and Manas Ghosh, "Programming in C," Second Edition, Oxford University Press, New Delhi, 2007.

I B. Tech. - II Semester

(16BT1HS01) **TECHNICAL ENGLISH**

(Common to ECE, EEE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	--	3

PRE-REQUISITES: English at Intermediate level

COURSE DESCRIPTION: Introduction to Communication; Active Listening; Effective Speaking; Reading; and Writing.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Demonstrate knowledge in
- ♦ Process of communication
- ♦ Modes of listening
- ♦ Paralinguistic features
- ♦ Skimming and Scanning
- ♦ Elements of style in writing

2: Analyze the possibilities and limitations of language for understanding
- ♦ Barriers to Communication
- ♦ Barriers to Effective Listening
- ♦ Barriers to Speaking
- ♦ Formal and metaphorical language

3: Design and develop functional skills for professional practice.

4: Apply writing skills in preparing and presenting documents

5: Function effectively as an individual and as a member in diverse teams.

6: Communicate effectively with the engineering community and society in formal and informal situations.

DETAILED SYLLABUS:

UNIT I - INTRODUCTION TO COMMUNICATION: (9 periods)

Introduction -Language as a Tool of Communication - Communicative Skills (Listening, Speaking, Reading and Writing) - Effective Communication - Modes of Communication - Barriers to Communication (classification).

UNIT II - ACTIVE LISTENING: (9 periods)

Introduction - Reasons for poor Listening - Traits of a Good Listener - Listening Modes - Types of Listening - Barriers to Effective Listening - Listening for General Content and Specific Information.

UNIT III - EFFECTIVE SPEAKING: (9 periods)

Introduction - Achieving Confidence, Clarity and Fluency - Paralinguistic Features - Barriers to Speaking - Types of Speaking - Persuasive Speaking.

UNIT IV - READING: (9 periods)

Introduction and Reading Rates - Reading and Interpretation - Intensive and Extensive Reading - Critical Reading - Reading for Different Purposes - SQ3R Reading Technique -Study Skills.

UNIT V - WRITING: (9 periods)

Introduction - Language - Elements of Style - Techniques for Good Technical Writing - Referencing and Styling - Right Words and Phrases - Sentences.

Total Periods: 45

TEXT BOOK:

1. Meenakshi Raman & Sangeetha Sharma, Technical Communication, Oxford University Press, New Delhi, 2012.

REFERENCE BOOKS:

1. Ashraf Rizvi, Effective Technical Communication, McGraw-Hill Education (India) Pvt.Ltd., New Delhi, 2015.
2. Sanjay Kumar & Pushp Lata, Communication Skills, Oxford University Press, New Delhi, 2013.
3. Teri Kwal Gamble and Michael Gamble, Communication Works, Tata Mc Graw-Hill, New Delhi, 2010.
4. Rajendra Pal and J.S. Korlahalli, Essentials of Business Communication, Sultan Chand and Sons (P) Ltd., New Delhi, 2010.

I B. Tech. - II Semester

(16BT1BS01): ENGINEERING CHEMISTRY

(Common to ECE, EEE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	--	3

PRE REQUISITE: Intermediate/Senior Secondary Chemistry

COURSE DESCRIPTION: Water technology, Chemistry of Engineering materials, Nanochemistry, Green Chemistry, Electro chemical cells, Sensors, Corrosion and Lubricants.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Acquire basic knowledge in water technology, engineering plastics, conducting polymers, composites, Electro chemical cells, Nano Chemistry, principles of Green Chemistry, corrosion phenomenon and lubricants.

2: Develop analytical skills in:
   a. Determination of hardness of water.
   b. Determination of viscosity, flame and fire points, cloud and pour points.

3: Develop designing skills in:
   a. Synthesis of engineering plastics.
   b. Chemical methods for the synthesis of Nano materials.

4: Develop skills for providing solutions through:
   a. Mitigation of hardness of water.
   b. Newer Nanomaterials and engineering plastics for specific applications

5: Acquire awareness to practice engineering in compliance to modern techniques such as:
   a. Nalgonda technique for defluoridation of water
   b. Electroplating technique for control of corrosion.

6: Acquire awareness to societal issues on:
   a. Quality of water.
   b. Bio-diesel
   c. Chemical materials utility and their impact.

DETAILED SYLLABUS:

UNIT–I: WATER TECHNOLOGY (9 periods)

Introduction: Types of water, impurities in water and their consequences, types of hardness of water, units of hardness of water, disadvantages of hardness of water, estimation of hardness of water by EDTA method, Boiler troubles: Scales and Sludges, Caustic embrittlement, Boiler corrosion and Priming and Foaming.

Softening of water: Zeolite process and Ion exchange process, advantages and disadvantages. Desalination of brackish water by Reverse Osmosis, Numerical problems on estimation of hardness of water.

Fluorides in water: Effects on human health, defluoridation method-Nalgonda method; comparison of merits and demerits of various defluoridation methods (Nalgonda, Bone Charcoal, Activated Alumina, Contact precipitation, Brick, Reverse osmosis).

UNIT – II: CHEMISTRY OF ENGINEERING MATERIALS (9 periods)

Engineering Plastics: Definition, general properties, synthesis, properties and applications of PC, PTFE, and PMMA.

Conducting polymers: Definition, types of conducting polymers: Intrinsic and extrinsic conducting polymers with examples, engineering applications of conducting polymers.

Biodegradable polymers: Definition, properties, classification, mechanism of degradation of biodegradable polymers and their applications.

Composites – Introduction, types of composites: fiber reinforced particulate and layered composites with examples, advantages of composites and applications.

UNIT– III: NANOCHEMISTRY AND GREEN CHEMISTRY (9 periods)

Nanochemistry: Introduction, classification, properties and applications of Nano materials (nano particles, nano tubes, nano wires, nano composites, dendrimers); synthesis of Nano materials – Sol-gel process.

Green Chemistry: Introduction, principles of green chemistry, Tools of Green Chemistry with Examples, Applications of Green Chemistry in science and technology.

Biodiesel: Introduction, Synthesis (Trans esterification method), advantages, disadvantages and applications.

UNIT–IV: ELECTROCHEMICAL CELLS AND SENSORS

(9 periods)

Electrochemical cell: Introduction, EMF of an electrochemical cell.

Batteries: Introduction, types of Batteries: primary and secondary batteries with examples, Ni-Cd batteries, Lithium-ion batteries, Lithium- Polymer batteries, Applications of batteries.

Fuel Cells: Definition, examples: $H_2 – O_2$ Fuel cell, solid oxide fuel cell, Bio-fuel cell and applications of fuel cells.

Sensors - Introduction, Types of Sensors, electrochemical sensor: construction and working principle of potentiometric sensor, and applications of electrochemical sensors.

UNIT–V: CORROSION AND LUBRICANTS (9 periods)

Corrosion: Introduction, Definition, types of corrosion (dry and wet corrosion), galvanic corrosion, concentration cell corrosion, Factors influencing corrosion, Corrosion control: cathodic protection; sacrificial anodic protection and impressed current cathodic protection; protective coatings: Galvanizing and Electroplating (Nickel).

Lubricants: Definition, functions of lubricants, mechanism of lubrication, classification of lubricants, properties of lubricants – viscosity, flash and fire points, cloud and pour points, Aniline points, neutralization number and mechanical strength.

Total periods: 45 periods

TEXT BOOKS:

1. P.C.Jain & Monika Jain, **Engineering Chemistry**, Dhanpat Rai Publishing Company (P) Ltd, New Delhi, 16th edition, 2013.
2. K.N. Jayaveera, G.V. Subba Reddy & C. Ramachandraiah **Engineering Chemistry**, Mc. Graw-Hill Higher Education, Hyderabad, 1st edition, 2015.

REFERENCE BOOKS:

1. A.K. Bandyopadhyay, **Nano Materials,** New Age international publishers, 2nd edition, 2014.
2. Paul T. Anastas and John C Warner, **Green Chemistry: Theory and practice,** Oxford University Press, 2000.

I B. Tech. - II Semester

(16BT2BS01) TRANSFORMATION TECHNIQUES AND PARTIAL DIFFERENTIAL EQUATIONS

(Common to all Branches)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	*70*	*100*	*3*	*1*	*--*	*3*

PRE REQUISITE: Intermediate /Senior secondary mathematics

COURSE DESCRIPTION: Fourier series; Fourier integrals and transforms; Laplace transforms; z –transforms; partial differential equations.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Acquire basic knowledge in
   (a) Fourier series and Fourier transforms
   (b) Fourier integrals
   (c) Laplace transforms and their applications
   (d) z- transforms and their applications
   (e) solving partial differential equations

2: Develop skills in analyzing the
   (a) Properties of Fourier series for a given function
   (b) Partial differential equations through different evaluation methods
   (c) Difference equations through z – transforms
   (d) Engineering systems and processes involving wave forms and heat transfer

3: Develop skills in designing mathematical models for
   (a) Problems involving heat transfer and wave forms
   (b) Engineering concepts involving, Fourier transforms, Fourier integrals, Laplace transforms, z-transforms and difference equations

4: Develop analytical skills in solving the problems involving
   (a) Fourier series and Fourier transforms
   (b) Laplace transforms
   (c) Z-transforms and difference equations
   (d) Heat transfer and wave motion

5: Use relevant transformation techniques for
   (a) Obtaining Fourier transforms for different types of functions
   (b) Laplace transforms
   (c) Z- transforms
   (d) Partial differential equations

DETAILED SYLLABUS

UNIT- I : FOURIER SERIES (7 periods)

Fourier series: Determination of Fourier coefficients, convergence of Fourier series (Dirichlet's conditions), Fourier series of even and odd functions, Half-range Fourier sine and cosine expansions.

UNIT- II: FOURIER INTEGRALS AND FOURIER TRANSFORMS (8 periods)

Fourier integral theorem (statement only), Fourier sine and cosine integrals, Fourier transform, Fourier sine and cosine transforms –properties, Inverse transform and finite Fourier transforms.

UNIT-III: LAPLACE TRANSFORMS (12 periods)

Laplace transforms of standard functions. Properties of Laplace transforms. First and second shifting Theorems. Laplace transforms of derivatives and integrals. Inverse transforms. Convolution theorem (without proof), inverse Laplace transforms by convolution theorem. Laplace transform of periodic functions, Applications of Laplace transforms to ordinary differential equations of first and second order with constant coefficients.

UNIT-IV: Z- TRANSFORMS (9 periods)

Z – transforms, inverse Z– transforms, damping rule, shifting rule, initial and final value theorems. Convolution theorem (without proof), solution of difference equations by Z– transforms.

UNIT – V: PARTIAL DIFFERENTIAL EQUATIONS (9 periods)

Formation of Partial differential equations – Solutions of first order linear equations by method of grouping. First and second order equations by method of separation of variables – Solutions of one dimensional Wave equation, Heat equation.

Total no. of periods: 45

TEXT BOOKS:

1. T.K.V. Iyengar, B. Krishna Gandhi,S.Ranganadham and M.V.S.S.N. Prasad,***Engineering Mathematics, vol-1***, S. Chand & Company 13/e,2014.
2. T.K.V. Iyenger, B. Krishna Gandhi, S.Ranganadham and M.V.S.S.N.Prasad, ***Mathematical Methods***,S.Chand and Company, 8/e,2013.

REFERENCE BOOKS:

1. Grewal, B.S., ***Higher Engineering Mathematics***,Khanna publishers, Delhi, 42/e,2012.
2. Kreyszig, E., ***Advanced Engineering Mathematics***,John Wiley and Sons, Inc.,9/e,2013.

I B. Tech. - II Semester

(16BT20401) ELECTRONIC DEVICES AND CIRCUITS

(Common to ECE, EEE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	--	3

PRE-REQUISITES: A Course on Engineering Physics.

COURSE DESCRIPTION:

Characteristics of general and special purpose electronic devices; Rectifiers; filters and regulators; Biasing and small signal analysis of BJT and FET.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Demonstrate knowledge in
- p-n junction diode and its characteristics
- Zener diode and its characteristics
- Rectifiers, Filters and Regulators
- Characteristics of BJT, FET, MOSFET and special purpose electronic devices.

2: Analyze numerical and analytical problems in
- Rectifiers using Filters
- Regulated Power Supplies
- Transistor biasing circuits and stabilization
- Transistor amplifiers
- FET biasing circuits and amplifiers

3: Design electronic circuits such as
- Rectifiers with and without filters
- Voltage regulators
- BJT and FET biasing circuits
- BJT and FET amplifiers

4: Solve engineering problems and arrive at solutions pertaining to electronic circuits.

5: Select appropriate technique for transistor modeling.

DETAILED SYLLABUS:

UNIT-I: P-N JUNCTION DIODE, RECTIFIERS AND REGULATORS (11 Periods)

P-N Junction Diode:

p-n Junction as a diode, *p-n* Junction diode equation, Volt-Ampere (V-I) characteristics, temperature dependence of *p-n* characteristics, diode resistance-static and dynamic resistances, transition and diffusion capacitances, break down mechanisms in semiconductor diodes, Zener diode characteristics.

Rectifiers and Regulators:

Half-Wave rectifier and Full-Wave rectifiers (Qualitative and quantitative analysis), Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L - section filter, ð- section filter, comparison of various filter circuits in terms of ripple factors. Simple circuit of a regulator using Zener diode. Problems on rectifier circuits.

UNIT-II- *BIPOLAR JUNCTION TRANSISTOR, BIASING AND STABILIZATION*: (10 Periods)

Transistor construction, BJT Operation, Transistor currents and their relations, Input and Output Characteristics of a Transistor in Common Emitter, Common Base and Common Collector Configurations, BJT specifications, Transistor Operating Point, DC and AC Load Lines, Importance of Biasing, Fixed Bias, Emitter Feedback Bias, Collector to Base Feedback Bias, Voltage Divider Bias, Bias Stability, Transistor as an amplifier, Thermal Runaway, Problems on biasing circuits.

UNIT-III- *SMALL SIGNAL ANALYSIS OF BJT AMPLIFIERS*: (08 Periods)

BJT Modeling, Hybrid Modeling, Determination of h-Parameters from Transistor Characteristics, Measurement of h-Parameters, Miller's Theorem, Analysis of CE, CB and CC configurations using simplified Hybrid Model, Comparison of CB, CE and CC configurations.

UNIT-IV- *FIELD EFFECT TRANSISTORS*: (10 Periods)

Construction, Principle of operation and characteristics of JFET and MOSFET (Enhancement & Depletion), Biasing of FET, Small Signal Model of JFET, Common Source and Common Drain Amplifiers using JFET, Generalized FET Amplifier, FET as Voltage Variable Resistor, Comparison of BJT and FET.

UNIT-V- *SPECIAL PURPOSE ELECTRONIC DEVICES*:

(06 Periods)

Principle of Operation and Characteristics of Tunnel Diode, Uni-Junction Transistor (UJT), Varactor Diode, Silicon Control Rectifier (SCR). Principle of operation of Schottky Barrier Diode.

Total Periods: *45*

TEXT BOOK:

1. J. Millman, Christos C. Halkias and SatyabrataJit, *Electronic Devices and Circuits,* TMH, 3rd Edition, 2010.

REFERENCE BOOKS:

1. R.L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits,* PHI, 10thEdition, 2009.
2. David A. Bell, *Electronic Devices and Circuits,* Oxford University press, 5thEdition, 2014.
3. S. Salivahanan, N. Suresh Kumar, *Electronic Devices and Circuits*, Mc-Graw Hill, 3rd Edition 2013.
4. Ben G. Streetman, Sanjay Banerjee , Solid State Electronic Devices, Pearson Prentice Hall, 2006.

I B. Tech. - II Semester

(16BT20541) FOUNDATIONS OF DATA STRUCTURES

(Common to ECE, EEE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	*70*	*100*	*3*	*1*	-	*3*

PRE-REQUISITES:

A course on "Programming in C"

COURSE DESCRIPTION:

Concepts of sorting: sorting by exchange, sorting by distribution, sorting by merging and data structures: stacks, queues, linked lists, trees, graphs, and hash table.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Gain knowledge in Sorting techniques, Linear and Non-linear Data Structures.
2: Analyze the performance of sorting techniques and their relationship to Data Structures.
3: Design appropriate hashing function for a given application and develop programs to implement Linear and Non-Linear data structures
4: Apply appropriate data structure to provide solutions for real time problems using C Language.

DETAILED SYLLABUS:

UNIT I – SORTING (9 periods)

SORTING - Sorting by Exchange-Shell Sort, Quick sort. Sorting By Distribution-Counting Sort, Bucket Sort, Radix Sort. Sorting By Merging-Merge Sort.

UNIT II– STACKS AND QUEUES (9 periods)

STACKS -Introduction, Stack Operations, Applications.

QUEUES - Introduction, Operations on Queues, Circular Queues and Applications.

UNIT III –LINKED LISTS (9 periods)

LINKED LISTS –Introduction, Single Linked List, Circular Linked List, Doubly Linked List, Multiply Linked List and Applications.

LINKED STACKS AND LINKED QUEUES - Introduction, Operations on Linked Stack and Linked Queues, Dynamic Memory Management and Linked Stacks.

UNIT IV – TREES AND BINARY TREES (9 periods)

TREES– Introduction, Definition and Basic Terminologies, Representation of Trees.

BINARY TREES – Basic Terminologies and Types, Representation of Binary Trees, Binary Tree Traversals, Binary Search Trees: Definition and Operations and Applications.

UNIT V – Graphs and Hashing (9 periods)

Graphs – Introduction, Definitions and Basic Terminologies, Representation of Graphs, Graph Traversals, Applications.

Hashing – Introduction, Hash Table Structure, Hash Functions, Linear Open Addressing, Chaining and Applications.

Total Periods: *45*

TEXT BOOK:

1. G.A.V. Pai, *"Data Structures and Algorithms",* Tata McGraw Hill, Second Edition, 2009.

REFERENCE BOOK:

1. Debasis Samanta, "Classic Data Structures", PHI Learning, Second Edition, 2009.

I B. Tech. - II Semester

(16BT1HS31) ENGLISH LANGUAGE LAB

(Common to ECE, EEE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	0	0	3	2

PRE-REQUISITES: English at intermediate or equivalent level.

COURSE DESCRIPTION: Phonetics; Vocabulary Building; Functional Grammar; Just a Minute; Elocution/Impromptu; Giving Directions/Conversation Starters; Role Play; Public Speaking; Describing People, Places, Objects and Events; Reading Comprehension; Listening Comprehension; Information Transfer.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Demonstrate knowledge in
- Phonetics
- Information Transfer

2: Analyze the situations in professional context by using
- Vocabulary
- Grammar

3: Design and develop functional skills for professional practice.

4: Apply the techniques of Listening and Reading skills to comprehend Listening and Reading comprehension.

5: Function effectively as an individual and as a member in diverse teams through
- Extempore talk and
- Role Play

6: Communicate effectively in public speaking in formal and informal situations.

7: Recognize the need to engage in lifelong learning to upgrade competence of knowledge and communication.

LIST OF EXERCISES:

1. Phonetics
2. Vocabulary Building
3. Functional Grammar
4. Just a Minute
5. Elocution/Impromptu
6. Giving Directions/Conversation Starters
7. Role Play
8. Public Speaking
9. Describing People, Places, Objects and Events.
10. Reading Comprehension
11. Listening Comprehension
12. Information Transfer

Total Lab Slots: 10

TEXT BOOK:

1. Department Lab Manual

REFERENCE BOOKS:

1. D. Sudha Rani, *A Manual for English Language Laboratories*, Pearson Education.
2. D. Sudha Rani, *Advanced Communication Skills Laboratory Manual*, Pearson Education.
3. R. Manivannan and G. Immanuel, *Communication Skills Laboratory*, VK Publications, Sivakasi, 2013
4. Nira Kumar*, English Language Laboratories*, PHI Learning Pvt. Ltd., New Delhi, 2011.

SUGGESTED SOFTWARE:

1. ETNL Language Lab Software Version 4.0
2. GEMS - Globarena E- Mentoring System.
3. Speech Solutions.
4. English Pronunciation Dictionary by Daniel Jones.
5. Learn to Speak English 8.1, The Learning Company - 4 CDs.
6. Mastering English: Grammar, Punctuation and Composition.
7. English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
8. Dorling Kindersley Series - Grammar.
9. Language in Use 1, 2 & 3.
10. Cambridge Advanced Learner's Dictionary - 3rd Edition.
11. Centronix - Phonetics.
12. Let's Talk English, Regional Institute of English South India.
13. The Ultimate English Tutor.

I B. Tech. - II Semester

(16BT1BS31): ENGINEERING CHEMISTRY LAB

(Common to ECE, EEE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	-	-	3	2

PRE REQUISITE: Intermediate/Senior Secondary Chemistry

COURSE DESCRIPTION: Estimation of hardness, alkalinity, dissolved oxygen of water samples and estimation of Iron by volumetric methods, determination of effect of P^H on rate of corrosion, measurement of viscosity of lubricants; Instrumental methods like potentiometer, conductivity meter, P^H meter and colorimeter; synthesis of Polymers and Nano materials.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Acquire basic Knowledge about the volumetric analysis and synthesis of materials used for engineering applications.

2: Acquire analytical skills in the estimation of hardness of water, alkalinity of water, dissolved oxygen in water and estimation of Iron through wet laboratory methods.

3: Develop designing skills for the synthesis of polymers and Nanomaterials.

4: Acquire skills to use instrumental techniques for the determination of Electrical conductance of electrolytes, EMF of a cell, PH of a solution, determination of viscosity of lubricants and estimation of iron in cement.

5: Provide solutions for environmental issues through determination of quality of water.

List of Experiments:

A minimum of any **Ten** experiments are to be conducted among the following:.

1. Estimation of Hardness of water by EDTA method.
2. Estimation of alkalinity of Water.
3. Estimation of Dissolved Oxygen in water.
4. Estimation of Ferrous Iron by Dichrometry.
5. Preparation of Novalac Resin.
6. Synthesis of Nano metal-oxide using sol– gel process.
7. Conductometric titration of strong acid Vs strong base
8. Estimation of Ferrous ion by Potentiometry.
9. Determination of amount of corrosion of metals in different medium
10. Measurement of viscosity of lubricants by Ostwald viscometer.
11. Determination of P^H of a given solution by P^H metry.
12. Estimation of Ferric iron in cement by Colorimetric method.

Total Time Slots: 12

I B. Tech. - II Semester

(16BT10331) COMPUTER AIDED ENGINEERING DRAWING

(Common to ECE, EEE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	*50*	*100*	*--*	*1*	*6*	*3*

PRE-REQUISITES: *None*

COURSE DESCRIPTION:

Engineering drawing conventions; importance of engineering drawing; fundamental concepts of sketching; computed aided drafting and different types of projections of geometric entities (both 2D and 3D) through computer aided drafting packages.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Understand, write and read the language of engineering drawing in industry through International System of Standards.
2: Develop the imagination and mental visualization ability for interpreting the geometrical details of engineering objects.
3: Produce different views and projection in drawing.
4: Use modern CAD software for design and drafting of drawings.
5: Create multi-view drawings suitable for presentation to Engineering community.
6: Introduce and communicate universally accepted conventions and symbols for their usage in technical drawing.

DETAILED SYLLABUS:

UNIT : I - BASICS OF ENGINEERING DRAWING PRACTICE, GEOMETRICAL CONSTRUCTIONS, CONICS AND SPECIAL CURVES (18 periods)

Introduction, drawing instruments and its uses, sheet layout, BIS conventions, lines, lettering and dimensioning practices. Geometrical constructions: Construction of regular polygons: Pentagon, Hexagon, Heptagon and Octagon. Conic sections**:** Introduction, construction of ellipse: rectangular method, eccentricity method. Construction of parabola: rectangular method, eccentricity method. Construction of hyperbola: eccentricity method. Special curves*:* cycloid, involute.

UNIT: II – INTRODUCTION TO COMPUTER AIDED SKETCHING (18 periods)

Computer screen, layout of the software, creation of 2D/3D environment, selection of drawing size and scale, Standard tool bar/menus, Coordinate system, description of most commonly used toolbars, navigational tools: commands and creation of lines, Co-ordinate points, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet, curves, constraints viz. tangency, parallelism, inclination and perpendicularity.

UNIT: III – PROJECTION OF POINTS, STRAIGHT LINES AND PLANES (21 periods)

Introduction, method of projection, planes of projection, reference line and notations. Projection of points: Points in all the four quadrants. Projection of straight lines**:** lines inclined to HP / VP plane, inclined to both HP and VP planes (straight lines are assumed to be in first quadrant only)**.** Projection of planes**:** projection of triangle, square, rectangle, rhombus, pentagon, hexagon and circular plane for the condition inclined to HP / VP by change of position method.

UNIT IV –PROJECTION OF SOLIDS AND SECTION OF SOLIDS (21 Periods)

Projections of Solids: Introduction, projection of solids: prisms, pyramids, cylinders and cones with axis perpendicular to VP/HP and axis inclined to VP/HP only. Sections of solids**:** Introduction, Cutting plane, sectional views of right regular solids resting with base on HP: prisms, pyramids, cylinder and cone and true shapes of the sections.

UNIT V –ORTHOGRAPHIC AND ISOMETRIC PROJECTIONS AND DEVELOPMENT OF SURFACES (22 periods)

Orthographic projection: simple exercises. Isometric projection: Simple exercises.

Development of surfaces: prisms, pyramids, cylinders, cone and miscellaneous surfaces

Total Periods: *100*

Note: *Student shall practice Unit-I using sketch book only and remaining units using sketch book first and later CAD package.*

TEXT BOOKS:

1. D.M.Kulkarni, A.P.Rastogi, A.K.Sarkar, Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi, Revised Edition, 2010.
2. N D Bhat & V M Panchal, Engineering Drawing, Charotar Publishing House, Gujarat, 51st edition, 2013.

REFERENCE BOOKS:

1. Sham Tickoo, AutoCAD 2013 for Engineers and Designers, Dreamtech Press, 2013.
2. M.H.Annaiah & Rajashekar Patil, Computer Aided Engineering Drawing, New Age International Publishers, 4th Edition, 2012.
3. T.Jeyapoovan, Engineering Drawing and Graphics Using AutoCAD, Vikas Publishing House, 3rd Edition, 2010.
4. Jolhe, Engineering Drawing, Tata McGraw Hill Education Private Limited, 1st Edition, 2007.
5. Basant Aggarwal, Engineering Drawing, Tata McGraw Hill Education Private Limited, 1st Edition, 2008.

I B. Tech. - II Semester

(16BT20551) FOUNDATIONS OF DATA STRUCTURES LAB

(Common to ECE, EEE & EIE)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	*50*	*100*	*0*	*0*	*3*	*2*

PRE-REQUISITES:

A course on "Foundations of Data Structures"

COURSE DESCRIPTION:

Hands on programming to implement data structures - Linked lists, Stacks, Queues, Trees, Search trees, Sorting, and Hashing in C Language.

COURSE OUTCOMES: After completion of the course, a successful student will be able to:

1: Gain practical knowledge on stacks, queues, trees, graphs and Hashing Techniques

2: Identify suitable data structure to solve engineering problems.

3: Design solutions for complex engineering problems using linear and non-linear data structures.

4: Develop algorithms leading to multiple solutions by conducting investigations of complex problems.

5: Apply 'C' language as a tool for implementing linear and non linear data structures

6: Communicate effectively by writing Programs and document practical work.

LIST OF PRACTICAL EXERCISES:

1. Implement the following sorting techniques
   (a) Quick Sort (b) Radix Sort (c) Merge Sort
2. Implement the following data structures using arrays
   (a)Stack (b) Queue (c) Circular Queue
3. Implement the following operations on a single linked list.
   (a) Creation (b) Insertion (c) Deletion (d) Display
4. Implement the following operations on a double linked list.
   (a) Creation (b) Insertion (c) Deletion (d) Display
5. Implement the following operations on a circular linked list.
   (a) Creation (b) Insertion (c) Deletion (d) Display
6. Implement the following data structures using linked list.
   (a) Stack (b) Queue (c) Circular Queue
7. Implement the following tree traversals on a binary tree
   (a) Preorder (b) Inorder (c) Postorder
8. Implement the following operation on binary search tree
   (a) Creation (b) Insertion (c) Deletion (d) Inorder
9. Implement the following graph traversal techniques
   (a) Breadth First traversal (b) Depth First Traversal
10. Implement the following Hashing Techniques
    (a) Separate Chaining (b) Open addressing methods

REFERENCE BOOKS:

1. G.A.V. Pai, *"Data Structures and Algorithms",* Tata McGraw Hill, Second Edition, 2009.
2. Debasis Samanta, "*Classic Data Structures",* PHI Learning, Second Edition, 2009.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

Sree Sainath Nagar, A.Rangampet, Near Tirupati - 517 102. A.P.

Salient Features of Prohibition of Ragging in Educational Institutions Act 26 of 1997

- Ragging within or outside the College is prohibited.
- Ragging means doing an act which causes or is likely to cause insult or annoyance or fear or apprehension or threat or intimidation or outrage of modesty or injury to a student

Nature of Ragging	Punishment
Teasing, Embarrassing and humiliating	Imprisonment up to 6 months or fine up to Rs. 1,000/- or Both
Assaulting or using criminal force or criminal intimidation	Imprisonment up to 1 year or fine up to Rs. 2,000/- or Both
Wrongfully restraining or confining or causing hurt	Imprisonment up to 2 years or fine up to Rs. 5,000/- or Both
Causing grievous hurt, Kidnapping or rape or committing unnatural offence	Imprisonment up to 5 years or fine up to Rs. 10,000/-
Causing death or abetting suicide	Imprisonment up to 10 years or fine up to Rs. 50,000/-

Note:

1. A student convicted of any of the above offences, will be expelled from the College.
2. A student imprisoned for more than six months for any of the above offences will not be admitted in any other College.
3. A student against whom there is prima facie evidence of ragging in any form will be suspended from the College immediately.
4. The full text of Act 26 of 1997 **and** UGC Regulations on Curbing the Menace of Ragging in Higher Educational Institutions, 2009 **(Dated 17th June, 2009) are placed in the College library for reference.**