

## **Vision of the Institution**

To ignite the minds of the students through academic excellence so as to bring about social transformation and prosperity.

## **Mission of the Institution**

- To expand the frontiers of knowledge through Quality Education.
- To provide valued added Research and Development.
- To embody a spirit of excellence in Teaching, Creativity, Scholarship and Outreach.
- To provide a platform for synergy of Academy, Industry and Community.
- To inculcate high standards of Ethical and Professional Behavior.

## **Vision of IT Department**

To be leaders in Information Technology through excellence in education, research and community outreach.

## **Mission of IT Department**

- To provide quality education in the core principles of Information Technology.
- To enable the students to apply the core concepts to solve real world problems.
- To amplify their potential through research and continuous learning for high quality career.
- To mould them as professionals with ethics and morals.

## **Program Educational Objectives(PEOs)**

**PEO1:** To provide students with a strong foundation in the mathematical, scientific and engineering fundamentals necessary to formulate, solve and analyze engineering problems.

**PEO2:** Graduates will succeed in entry-level engineering positions in IT industry and with government agencies.

**PEO3:** Graduates will succeed in the pursuit of advanced degrees in engineering or other fields and will have skills for, continued independent, lifelong learning to become experts in their profession.

**PEO4:** Empower students with effective teamwork, communication skills, leadership skills, ethical values and high integrity to serve the interests of the society and nation.

## Program Outcomes(POs) of IT Department

### Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### Program Specific Outcomes (PSOs)of IT Department

1. An ability to demonstrate basic knowledge in databases, programming languages, common business functions and algorithm analysis to design and develop appropriate Information Technology solutions.
2. Ability to organize an IT Infrastructure, manage and monitor resources and secure the data.

# ACADEMIC REGULATIONS

## B.Tech. FOUR YEAR DEGREE COURSE

### R19 Regulations

(Applicable for the batches admitted from 2019-2020)



## VISHNU INSTITUTE OF TECHNOLOGY:: BHIMAVARAM

(Autonomous)

Approved by AICTE & Affiliated to JNTUK, Kakinada

Accredited with 'A' Grade by NAAC & NBA

Vishnupur, Bhimavaram, West Godavari Dist., Andhra Pradesh, India.

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# REGULATIONS-19

## THE DEGREE OF BACHELOR OF TECHNOLOGY - REGULAR (With effect from 2019-20)

<b>RB 0.0</b>	<b>TITLE AND DURATION OF THE COURSE</b>
	The course shall be called the degree course in Bachelor of Technology, abbreviated as B.Tech.
	The course shall be of four academic years duration divided into eight semesters, each semester having duration of minimum 16 weeks.
	The calendar of events in respect of the course shall be fixed by the Institute from time to time.
	The external examination in all the subjects shall be conducted at the end of each semester for all the eight semesters.
	Students joining the B.Tech. programme shall have to complete the programme in a stipulated time frame of 8 years from the date of joining and students joining the B.Tech. Programme in the third semester directly through Lateral Entry Scheme (LES) shall have to complete the programme in a stipulated time frame of 6 years from the date of joining. Otherwise, they shall forfeit their seat in B.Tech. Programme and their admission shall stand cancelled.
	When a student is detained for lack of credits / shortage of attendance, he/she may be readmitted into the same semester / year in which he/she has been detained. However, the academic regulations under which he/she was first admitted shall continue to be applicable.
<b>RB 1.0</b>	<b>ELIGIBILITY FOR ADMISSION</b>
RB 1.1	Admissions are done as per the norms prescribed by the Government. The Government orders issued from time to time in this regard shall prevail.
RB 1.2	The Candidate shall be an Indian National.
RB 1.3	The Candidate should have passed the qualifying examination, i.e., Intermediate or equivalent on the date of admission.
RB 1.4	Seats in each programme in the college are classified into CATEGORY-A (70% of intake) and CATEGORY – B (30% of intake) besides lateral entry.
RB 1.5	Category 'A' Seats shall be filled by the Convener, EAMCET Admissions. Category 'B' Seats shall be filled by the College as per the guidelines of Andhra Pradesh State Council of Higher Education. 'Lateral Entry' candidates shall be admitted into the Third semester directly based on the rank secured by the candidate in Engineering Common Entrance Test (ECET) in accordance with the instructions given by the Convener, ECET and the Government of Andhra Pradesh.
<b>RB 2.0</b>	<b>AWARD OF B.TECH. DEGREE</b>
RB 2.1	A Regular Student shall be declared eligible for the award of the B.Tech. Degree, if he/she pursues a course of study in not less than four and not more than eight academic years. A Lateral Entry Student admitted into III semester shall be declared eligible for the award of the B.Tech. Degree, if he/she pursues a course of study in not less than three and not more than six academic years.

RB 2.2	<p>Each discipline of the B.Tech. programme is designed to have a total of 160 credits and the student shall have to complete the courses and earn all credits as per the requirements for award of the degree.</p> <p>Students joining the B.Tech. programme in the third semester directly through Lateral Entry Scheme (LES) shall have to complete the courses, excluding first year courses and credits as per the requirements for award of the degree.</p>
RB 2.3	<p>The B.Tech. Degree shall be conferred on a candidate who has satisfied the following requirements.</p> <p>A Regular student (four year programme) should register for 160 credits. In order to become eligible for the award of B.Tech. Degree, the student must obtain 160 credits.</p> <p>A Lateral Entry student should register for (160- first Year credits) credits and should obtain all the credits. However, it is mandatory for the students to complete the non-credit courses</p>
<b>RB 3.0</b>	<b>MINIMUM INSTRUCTION DAYS</b>
RB 3.1	The minimum instruction days for each semester shall be 90 working days.
<b>RB 4.0</b>	<b>COURSES OF STUDY</b>
	<p><u>Branch Code- Branch Abbreviation</u></p> <p>01-CE ( Civil Engineering )</p> <p>02-EEE ( Electrical and Electronics Engineering )</p> <p>03-ME ( Mechanical Engineering )</p> <p>04-ECE ( Electronics and Communication Engineering )</p> <p>05-CSE ( Computer Science &amp; Engineering )</p> <p>12-IT ( Information Technology )</p>
RB 4.1	<p><b>Groups of Courses:</b> The Courses in the B.Tech. Programme is of four kinds: Core, Professional Elective, Open Elective, and Mandatory Audit Course.</p> <p><b>Core Course:</b> These are courses which are to be compulsorily studied by a student and it is the core requirement to complete the programme in a said branch.</p> <p><b>Professional Elective Course:</b> A student can choose a course (subject) from a pool of courses of branch concerned, which add proficiency to the students.</p> <p><b>Open Elective Course:</b> These are the courses offered by the other branches. These courses are designed to lead to knowledge enhancement in multi disciplinary domains.</p> <p><b>Mandatory Audit Course:</b> These courses allow a student to attend classes without the benefit of a grade for a course. An undergraduate student who audits a course does so, for the purpose of self-enrichment and academic exploration.</p>
<b>RB 5.0</b>	<b>DISTRIBUTION AND WEIGHTAGE OF MARKS</b>
RB 5.1	The performance of a student in each semester shall be evaluated subject wise with a maximum of 100 marks for theory and 100 marks for practical subject. The Project-I shall be evaluated for 50 marks, Project-II evaluated for 200 marks, ,Socially Relevant Projects for 50 marks, internship for 50 marks and seminar for 50 marks.
RB 5.2	For theory subjects, the distribution shall be 40 marks for Internal Evaluation and 60 marks for the End Examinations.

RB 5.3	<p>The Internal evaluation 40 marks shall be awarded as follows: 20 marks for Descriptive, 10 marks for Quiz and 10 marks for Assignment.</p> <p>The descriptive examination is for 90 minutes duration conducted for 30 marks. Each descriptive examination question paper consists of three questions (either - or type) from three units. Three questions to be answered, one from each unit. The descriptive examination conducted for 30 Marks is to be brought down to total marks of 20. The quiz examination is for 20 minutes duration (Conducted with 20 multiple choice questions with a weightage of ½ Mark each). Thought provoking questions shall be covered in Quiz examination.</p> <p>After every two Units, one Assignment/Tutorial shall be conducted. Two questions from each Unit and maximum of 4 questions must be set in Assignment. Assignment/Tutorial consists of Theory, Design, Analysis, Simulation, Algorithms, Drawing, etc. as the case may be. Out of the 3 Assignments / tutorials, average of best of the 2 Assignments shall be considered for awarding of marks.</p> <p>For theory subjects, during the semester there shall be 2 MID tests. As the syllabus is framed for 6 units, the First MID examination (both descriptive and quiz) is conducted on the first three units and Second MID examination (both descriptive and quiz) is considered from last three units of each subject. Average of two Mid tests (both descriptive and quiz) shall be considered as final marks of the MID. Eg: A student got 18 marks out of 20 marks in Descriptive-1, 8 marks out of 10 marks in Quiz-1 and 8 marks out of 20 marks in Descriptive-2 and 2 marks out of 10 marks in Quiz-2. Assignment-1 = 9 out of 10, Assignment-2 = 4 out of 10 and Assignment-3 = 10 out of 10.</p> <p>The student Internal marks are = <math>((26+10)/2 + ((9+10)/2) = 27.5</math> is rounded to 28 marks out of 40 marks.</p> <p>If a student is absent from any one MID examination, he/she can appear for a Grand Test after MID-2. The Grand Test will be conducted with questions covering the entire syllabus. The marks in the grand test is reduced to 30 marks and to be considered for the respective mid.</p>
RB 5.4	<p>The end semester examination is conducted for 60 marks. It consists of 6 questions (either - or type) with 10 marks each. For design subjects (like Design Drawing Concrete Structures, Steel Structures, Building Planning and Drawing), the pattern will consist of 2 parts (part-A and B), where in part-A 2 questions will be given with each question carrying 24 marks, out of which the student has to answer one question and part-B consists of 6 questions with each question carrying 12 marks each, out of which the student has to answer 3 questions.</p>
RB 5.5	<p>For practical subjects, there shall be continuous evaluation during the semester for 40 internal marks. Out of the 40 marks for internal, day-to-day work 15 marks, Record 10 marks and 15 marks to be awarded by conducting an internal laboratory test. The end examination shall be conducted for 60 marks by the internal examiner and the external examiner.</p>
RB 5.6	<p>For the subject having design and/or drawing (such as Engineering Graphics, Engineering Drawing, Machine Drawing, Design Drawing Concrete Structures, Steel Structures, Building Planning and Drawing), the distribution shall be 40 marks for internal evaluation (20 marks for day-to-day work, and 20 marks for MID tests) and 60 marks for end examination. The average of 2 MIDs shall be considered as final marks of the MID.</p>

RB 5.7	For the seminar, the student shall collect the information on a specialized topic and prepare a technical report showing his/her understanding over the topic, and submit to the department, which shall be evaluated by the Departmental Committee consisting of the Head of the Department, a seminar supervisor and a senior faculty member. The seminar report shall be evaluated for 50 marks. There shall be no external examination for seminar.
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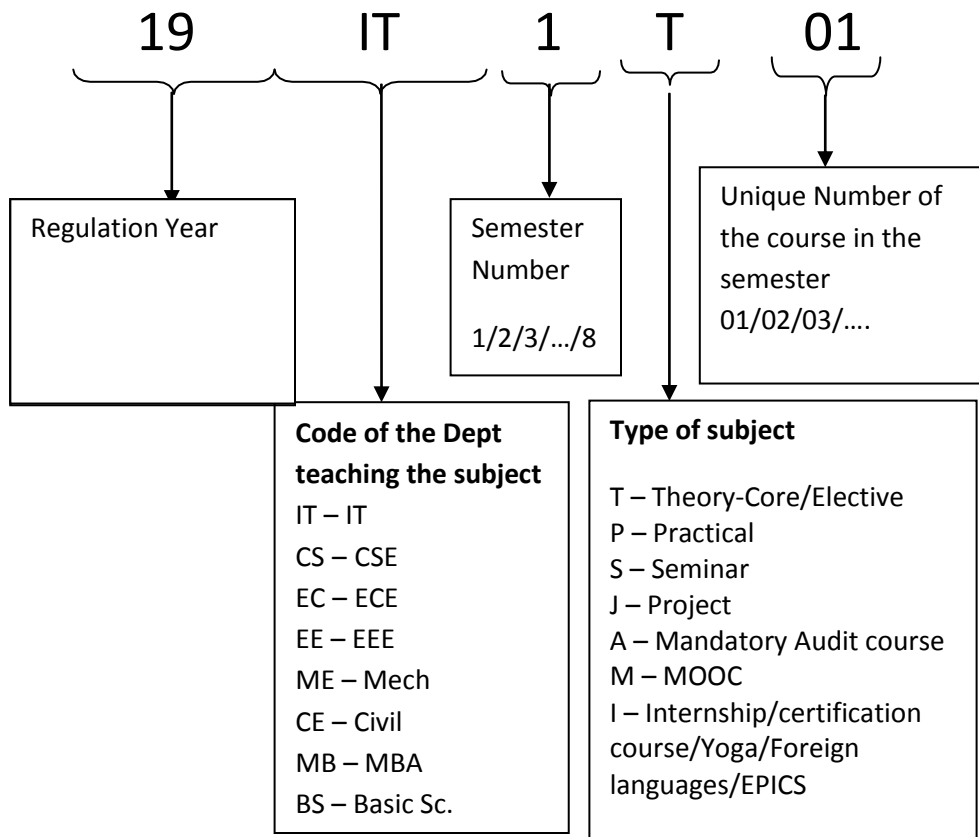
RB 5.8	Out of a total of 200 marks for the Project-II, 80 marks shall be for Internal Evaluation and 120 marks for the End Semester Examination. The End Semester Examination (Viva – Voce) shall be conducted by the Committee. The Committee consists of an external examiner, Head of the Department and Supervisor of the Project. The evaluation of project work shall be conducted at the end of the Eighth semester. The Internal Evaluation marks shall be on the basis of two seminars given by each student on the topic of his/her project and evaluated by an Internal Committee, consisting of Head of the department, the supervisor of the project and a senior faculty member.	
RB 5.9	For the Project-I, 50 marks shall be for the Internal Evaluation. Viva- Voce shall be conducted by the Committee. The Committee consists of the Head of the Department, one Senior Faculty Member and the Supervisor of the Project. The Viva–Voce may be conducted along with respective semester lab external examinations. There shall be no external examination for mini projects.	
RB 5.10	Laboratory marks and the internal marks awarded by the department are not final. The marks are subjected to be scrutinized and scaled by the Institute wherever it is felt desirable. The internal and laboratory marks awarded by the department shall be referred to a Committee if required. The Committee shall arrive at a scaling factor and the marks shall be scaled as per the scaling factor. The recommendations of the Committee are final and binding. The laboratory records and internal test papers shall be preserved for two years after the final examination of that semester in the respective departments as per the norms of the Institute and shall be produced to the Committees as and when they ask for.	
RB 6.0	<b>PROGRAMME STRUCTURE</b>	
	Basic Science Courses	15-16%
	Engineering Science Courses	10-19%
	Humanities and Social Science Courses	6-9%
	Professional Core Courses	31-40%
	Professional Elective Courses	7-13%
	Project / Internships / Certification Courses/ Seminar	8-9%
	Open Elective Courses	5-10%
	Mandatory Audit Courses	-
RB 7.0	<b>SCHEME OF INSTRUCTION FOR I, II, III AND IV YEARS</b>	
RB 7.1	The Schemes of Instruction and syllabi of all B.Tech. programmes are given separately, which are approved by the BOS concerned and the Academic Council.	
RB 8.0	<b>CONTACT HOURS AND CREDITS</b>	
RB 8.1	One hour of lecture/Tutorial is equivalent to one credit and one hour of practical work/field work is equivalent to 0.5 credit.	
RB 8.2	<b>THEORY / TUTORIAL CLASSES</b> Each course is prescribed with a fixed number of lecture periods per week. During lecture periods, the course instructor shall deal with the concepts of the course. For certain courses, tutorial periods are prescribed in order to give exercises to the students and to closely monitor their learning abilities and achievements.	
RB 8.3	<b>LABORATORY / DRAWING COURSES</b> A minimum prescribed number of experiments/drawings/jobs/programmes have to be performed by students, who shall complete these in all aspects and get each experiment evaluated by the teacher concerned and certified by the Head of the Department concerned at the end of the semester.	
RB 9.0	<b>MEDIUM OF INSTRUCTION</b>	
	The Medium of Instruction and examination is in English.	



<b>RB 10.0</b>	<b>ATTENDANCE REQUIREMENTS</b>
RB 10.1	In each semester, the candidate has to put in a minimum attendance of 75% with a provision of condonation of 10% of the attendance by the Principal on the specific recommendation of the HOD, showing some reasonable cause such as medical grounds, participation in University level sports, cultural activities, seminars, workshops, paper presentation etc.
RB 10.2	Students, having shortage of attendance and got condonation for attendance, shall have to pay requisite fee towards condonation.
RB 10.3	Shortage of attendance below 65% in aggregate shall not be condoned.
RB 10.4	Students whose shortage of attendance is not condoned will be detained and the student has to re-register for that semester when it is offered by the department.

RB 10.5	<p>Rules for calculation of attendance for the re-admitted candidates who were detained for want of attendance or who had break – in study for various reasons:</p> <p>a) No. of classes conducted shall be counted from the day one of the semester concerned, irrespective of the date of payment of tuition fee.</p> <p>b) They should submit a written request to the Principal, along with a challan paid towards tuition and other fee, for re-admission before the commencement of class-work.</p> <p>c) Student should come to know about the date of commencement of class-work of the semester into which he/she wishes to get re-admission. The information regarding date of commencement of class-work for each semester is available in the college noticeboards/website.</p>
<b>RB 11.0</b>	<b>CONDITIONS FOR PASS AND AWARD OF CREDITS FOR A COURSE</b>
RB 11.1	A candidate shall be declared to have passed in individual theory/drawing course if he/she secures a minimum of 40% aggregate marks (40 marks out of 100, Internal and semester end examination marks put together), subject to a minimum of 35% marks (21 marks out of 60) in semester end examination. For successful completion of mandatory audit course, the student must get a satisfactory grade from the department offering the course. If fails, he/she has to reappear whenever the course is offered.
RB 11.2	A candidate shall be declared to have passed in individual lab/project course if he/she secures a minimum of 40% aggregate marks (Internal and semester end examination marks put together), subject to minimum of 35% marks in semester end examination.
RB 11.3	The student has to pass the failed course by appearing the supplementary examination as per the requirement for the award of degree.
RB 11.4	On passing a course of a programme, the student shall earn assigned credits in that course.
<b>RB 12.0</b>	<b>TRANSITORY REGULATIONS</b>
RB 12.1	A candidate, who is detained or discontinued in the semester, on readmission shall be required to pass all the courses in the curriculum prescribed for such batch of students in which he/she joins subsequently. However, exemption shall be given to those candidates who have already passed in such courses in the earlier semester(s) and substitute subject may be offered as approved by College Academic Committee and ratified by the Academic Council.
RB 12.2	A student shall be eligible for promotion to the next semester of B.Tech. programme, if he/she satisfies the conditions as stipulated in Regulation RB10.

<p>RB 12.3</p>	<p>A student will be promoted from II year to III year if he/she fulfills the academic requirement of 40% of the credits up to either II year I semester or II year II semester from all the examinations, whether or not the candidate takes the examinations and secures prescribed minimum attendance in II year II semester.</p> <p>A student shall be promoted from III year to IV year if he/she fulfills the academic requirements of 40% of the credits up to either III year I semester or III year II semester from all the examinations, whether or not the candidate takes the examinations and secures prescribed minimum attendance in III year II semester.</p> <p><b>For Lateral Entry Candidates</b></p> <p>A student shall be promoted from III year to IV year if he/she fulfills the academic requirements of 40% of the credits up to either III year I semester or III year II semester from all the examinations, whether or not the candidate takes the examinations and secures prescribed minimum attendance in III year II semester.</p>
<p>RB 13.0</p>	<p><b>COURSE CODE AND COURSE NUMBERING SCHEME:</b> The subject codes shall be given by the Department teaching the subject. Each subject code contains 8 characters. The 8 Characters for each subject shall be coded as per the following guidelines.</p>



	<p>While giving the subject codes the Departments can follow the following steps.</p> <p>i. Collect the requirements from various Departments.(subjects which they have to teach for other Departments)</p> <p>ii. Prepare a list of all the subjects the Departments have to teach in that semester (for their Department as well as the other Departments based on the requirements they have collected in point i.)</p> <p>iii. Give subject codes to all these subjects following the guidelines given.</p> <p>iv. Communicate these subject codes (identified in point i) to various Departments.</p> <p>v. Use the subject codes identified in point i to the subjects in their course structure.</p>																																													
<b>RB 14.0</b>	<b>CONSOLIDATED GRADE CARD</b>																																													
	A consolidated grade card containing credits and grades obtained by the candidate shall be issued after completion of the four year B.Tech. Programme.																																													
<b>RB 15.0</b>	<b>METHOD OF AWARDING LETTER GRADES AND GRADE POINTS FOR A COURSE</b>																																													
	A letter grade and grade point shall be awarded to the student in each course based on his/her performance as per the grading system given below																																													
RB 15.1	<table border="1"> <thead> <tr> <th>Marks Range Theory/Lab (Max – 100)</th> <th>Marks Range for subjects with Max – 50</th> <th>Letter Grade</th> <th>Level</th> <th>Grade Point</th> </tr> </thead> <tbody> <tr> <td>≥ 90</td> <td>≥ 45</td> <td>O</td> <td>Outstanding</td> <td>10</td> </tr> <tr> <td>≥ 80 &lt; 90</td> <td>≥ 40 &lt; 45</td> <td>S</td> <td>Excellent</td> <td>9</td> </tr> <tr> <td>≥ 70 &lt; 80</td> <td>≥ 35 &lt; 40</td> <td>A</td> <td>Very Good</td> <td>8</td> </tr> <tr> <td>≥ 60 &lt; 70</td> <td>≥ 30 &lt; 35</td> <td>B</td> <td>Good</td> <td>7</td> </tr> <tr> <td>≥ 50 &lt; 60</td> <td>≥ 25 &lt; 30</td> <td>C</td> <td>Fair</td> <td>6</td> </tr> <tr> <td>≥ 40 &lt; 50</td> <td>≥ 20 &lt; 25</td> <td>D</td> <td>Satisfactory</td> <td>5</td> </tr> <tr> <td>&lt; 40</td> <td>&lt; 20</td> <td>F</td> <td>Fail</td> <td>0</td> </tr> <tr> <td></td> <td></td> <td></td> <td>Absent</td> <td>0</td> </tr> </tbody> </table>	Marks Range Theory/Lab (Max – 100)	Marks Range for subjects with Max – 50	Letter Grade	Level	Grade Point	≥ 90	≥ 45	O	Outstanding	10	≥ 80 < 90	≥ 40 < 45	S	Excellent	9	≥ 70 < 80	≥ 35 < 40	A	Very Good	8	≥ 60 < 70	≥ 30 < 35	B	Good	7	≥ 50 < 60	≥ 25 < 30	C	Fair	6	≥ 40 < 50	≥ 20 < 25	D	Satisfactory	5	< 40	< 20	F	Fail	0				Absent	0
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RB 15.2	<p><b>Calculation of Semester Grade Points Average (SGPA)* for semester:</b>  <b>The Performance of each student at the end of each semester is indicated in terms of SGPA.</b>  <b>The SGPA is calculated as below:</b></p> $SGPA (S_i) = \sum(C_i \times G_i) / \sum C_i \text{ (for all courses passed in that semester)}$ <p>Where <math>C_i</math> is the number of credits of the <math>i^{th}</math> course and <math>G_i</math> is the grade point scored by the student in the <math>i^{th}</math> course.</p> <p>* SGPA is calculated for the candidates who passed all the courses in that semester</p>																																													
RB 15.3	<p><b>Calculation of Cumulative Grade Points Average (CGPA)</b></p> <p>The CGPA is calculated as below:</p> $CGPA = \sum(C_i \times S_i) / \sum C_i \text{ (for entire programme)}$ <p>Where <math>S_i</math> is the SGPA of the <math>i^{th}</math> semester and <math>C_i</math> is the total number of credits in that semester.  The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts</p>																																													
RB 15.4	Equivalent Percentage for CGPA is = $(CGPA - 0.75) \times 10$																																													

RB 16.0	<p><b>REVALUATION</b></p> <p>As per the notification issued by the Controller of Examination, the student can submit the application for revaluation, along with the fee receipt for revaluation of his/her answer script(s) of theory course(s), if he/she is not satisfied with the Grade obtained. The Controller of Examination shall arrange for revaluation of those answerscript(s).</p>
RB 16.1	<p>For Revaluation, a new external examiner, other than the first examiner, shall re-evaluate the answer script(s). If there is any change in marks (below 15% of the maximum External marks) the highest of the two marks will be considered and if there is any change in marks (Equal or above 15% of the maximum External marks), the script will be evaluated by the third valuator. The marks of all the three valutors are compared and the average of two nearer marks will be awarded to the student.</p>
RB 17.0	<p><b>SUPPLEMENTARY EXAMINATIONS.</b></p> <p>Supplementary examinations shall be conducted twice in an academic year, along with regular semester end examinations.</p>
RB 18.0	<p><b>READMISSION CRITERIA.</b></p> <p>A candidate, who is detained in a semester due to lack of attendance/ credits, has to obtain written permission from the Principal for readmission in the same semester after duly fulfilling all the required norms stipulated by the college in addition to paying an administrative fee ofRs.1,000/-</p>
RB 19.0	<p><b>BREAK IN STUDY.</b></p> <p>Student, who discontinues his/her studies for whatsoever may be the reason, can get readmission into appropriate semester of B.Tech. programme after break-in study only with the prior permission of the Principal of the College provided, such candidate shall follow the transitory regulations applicable to such batch in which he/she joins. An administrative fee of Rs.1000/- per year of break in study in addition to the prescribed tuition fee andspecial fee has to be paid by the candidate to condone his/her break in study.</p>
RB 20.0	<p><b>AWARD OF DIVISION.</b></p> <p>The award of divisionforthe candidates who are admitted into respective B.Tech. programmesintheyear2019-2020andonwards should be as per JNTUK regulations.</p> <p>For the purpose of awarding First Class with Distinction, the student must get CGPA within 4 years in case of candidates admitted through EAMCET &amp; Management Quota or within 3 years in case of Lateral Entry candidates admitted through ECET, without appearing for any supplementary examinations. Detained candidates are not eligible for the award of First Class withDistinction.</p> <p>For the purpose of awarding First, Second and Pass Class, CGPA obtained in the examinations appeared within the maximum period allowed for the completion of course shall be considered.</p>

<b>RB 21.0</b>	<b>BETTERMENT /IMPROVEMENT OF CUMULATIVE GRADE POINT AVERAGE</b>
RB 21.1	A candidate, after becoming eligible for the award of the Degree, may reappear for the external Examination in any of the theory courses as and when conducted, for the purpose of improving the CGPA. But this reappearance shall be within a period of two academic years after becoming eligible for the award of the Degree, subject to fulfillment of Regulation RB2.0.
RB 21.2	However, this facility shall not be availed by a candidate to reappear either for Internal Examination or for Semester End Examinations in Practical courses (including Project Viva-voce) and also for Semester End Examinations evaluated internally for the purpose of improvement.
RB 21.3	Modified Grade Card and New Consolidated Grade Card shall be issued after incorporating new Grades andCredits.
<b>RB 22.0</b>	<b>ADVANCED SUPPLEMENTARY EXAMINATIONS</b>
	Candidate(s), who fails in Theory or Lab courses of 4 <sup>th</sup> year second semester, can appear for advanced supplementary examinations conducted within one month after declaration of the revaluation results. However, those candidates who fail in this advanced supplementary examinations of IV year second semester shall appear for subsequent examination along with regular candidates in the examinations conducted at the end of the respective academic year.
<b>RB 23.0</b>	<b>MALPRACTICES</b> The Principal/chief superintendent shall refer the cases of malpractices in internal assessment tests and Semester End Examinations to a Malpractice Enquiry Committee, constituted for the purpose. The Principal shall take necessary action, against the erring students based on the recommendations of the Committee as per JNTUK Malpracticeregulations.
<b>RB 24.0</b>	The physically challenged candidates who have availed additional examination time and a scribe during their Intermediate/EAMCET examinations shall be given similar concessions on production of relevant proof/documents.
<b>RB 25.0</b>	The students who are suffering from contagious diseases are not allowed to appear either internal or Semester end examinations with other students. A separate room will be allotted for such type of students.
<b>RB 26.0</b>	The students who participate in coaching/tournaments held at State/National/International levels through University/Indian Olympic Association during Semester end external examination period shall be promoted to subsequent semesters till the entire courseis completed as per the guidelines of University Grants Commission Letter No. F. 1-5/88 (SPE/PES), dated 18-08-1994.
<b>RB 27.0</b>	The Principal shall deal with any academic problem, which is not covered under these rules and regulations, in consultation with the Heads of the Departments in an appropriate manner, and subsequently such actions shall be placed before the Academic Council for ratification. Any emergency modification of Regulation, approved in the Heads of the Departmentsmeetings,shallbereportedtotheAcademicCouncilforratification.
<b>RB 28.0</b>	The Academic Council, from time to time, may revise or amend or change the Regulations, schemes of examination and/or syllabi.

<b>RB 29.0</b>	<b>ELECTIVES</b> Minimum 20% of intake of students is compulsory for offering regular electives.
<b>RB 30.0</b>	<b>INTERNSHIP</b> For internship, minimum period shall be one month. However, it can be completed in 3 to 4 slots /intervals which shall be a minimum of five day slot.

## MALPRACTICES RULES

### Disciplinary Action for / Improper Conduct in Examinations

S.NO	Nature of Malpractices / Improper conduct	Punishment
1.(a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which 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 subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
1.(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 subject 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 subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled and held with the Institution.
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 and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practical and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all Institution 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 subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from classwork and all

		Institution 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 subject.
6	Refuses to obey the orders of the Chief Superintendent/Assistant– Superintendent / 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 officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-incharge, 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 subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all Institution 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 subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The



		candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the Performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Institution for further action to award suitable punishment.	

#### **Malpractices identified by squad or special invigilators**

1. Punishments to the candidates as per the above guidelines.
2. Punishment for institutions: (if the squad reports that the college is also involved in encouraging malpractices)
  - (i) A show cause notice shall be issued to the college.
  - (ii) Impose a suitable fine on the college.
  - (iii) Shifting the examination centre from the college to another college for a specific period of not less than one year.

\* \* \* \*

# VISHNU INSTITUTE OF TECHNOLOGY

(AUTONOMOUS)

(Approved by AICTE & Affiliated to JNTU-Kakinada)

(Accredited by NBA& NAAC 'A' Grade)






Vishnupur, BHIMAVARAM – 534 202

## **Ragging**

### Prohibition of ragging in Educational institutions Act 26 of 1997

#### Salient Features

- Ragging within or outside any educational institution is prohibited.
- Ragging means doing an act which causes or is likely to cause Insult or Annoyance of Fear or Apprehension or Threat or Intimidation or outrage of modesty or Injury to a student.

	Imprisonment upto		Fine Upto
Teasing, Embarrassing & Humiliation	 <b>6 Months</b>	+	<b>Rs. 1,000/-</b>
Assaulting or Using Criminal force or Criminal intimidation	 <b>1 Year</b>	+	<b>Rs. 2,000/-</b>
Wrongfully restraining or confining or causing hurt	 <b>2 Years</b>	+	<b>Rs. 5,000/-</b>
Causing grievous hurt, kidnapping or Abducts or rape or committing unnatural offence	 <b>5 Years</b>	+	<b>Rs. 10,000/-</b>
Causing death or abetting suicide	 <b>10 Months</b>	+	<b>Rs. 50,000/-</b>

**LET US MAKE VIT A RAGGING FREE COLLEGE**

# VISHNU INSTITUTE OF TECHNOLOGY

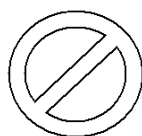
(AUTONOMOUS)

(Approved by AICTE & Affiliated to JNTU-Kakinada)

(Accredited by NBA& NAAC 'A' Grade)

Vishnupur, BHIMAVARAM – 534 202

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# Ragging

**ABSOLUTELY  
NOT TO RAGGING**

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1. Ragging is prohibited as per Act 26 of A.P. Legislative Assembly, 1997.
2. Ragging entails heavy fines and/or imprisonment.
3. Ragging invokes suspension and dismissal from the College.
4. Outsiders are prohibited from entering the College and Hostel without permission.
5. Girl students must be in their hostel rooms by 7.00 p.m.
6. All the students must carry their Identity Cards and show them when demanded.
7. The Principal and the Wardens may visit the Hostels and inspect the rooms any time.

**LET US MAKE VIT A RAGGING FREE COLLEGE**

# **B.Tech. (IT)**

## **R19 Course Structure**

## R19 Course Structure for B.Tech.(IT) (With effect from 2019-2020)

<b>I YEAR I SEMESTER</b>							
<b>S.No</b>	<b>Subject</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>I</b>	<b>E</b>
1	Mathematics-I (Linear Algebra and Calculus)	2	1	-	3	40	60
2	Applied Chemistry	3	-	-	3	40	60
3	Computer Programming Using C	3	-	-	3	40	60
4	Elements of Electrical and Electronic Engineering	3	-	-	3	40	60
5	Engineering Graphics and Design	1	-	3	2.5	40	60
6	Applied Chemistry Lab	-	-	3	1.5	40	60
7	Computer Programming Lab	-	-	3	1.5	40	60
8	Electrical and Electronic Engineering Lab	-	-	3	1.5	40	60
9	Environmental Science	3	-	-	-	0	0
<b>Total</b>		<b>15</b>	<b>1</b>	<b>12</b>	<b>19</b>	<b>320</b>	<b>480</b>
						<b>800</b>	
<b>I YEAR II SEMESTER</b>							
<b>S.No</b>	<b>Subject</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>I</b>	<b>E</b>
1	Communicative English	2	-	-	2	40	60
2	Mathematics –II (Probability and Statistics)	3	1	-	4	40	60
3	Applied Physics	3	-	-	3	40	60
4	Python Programming	3	-	-	3	40	60
5	English Communication Skills Lab	-	-	3	1.5	40	60
6	Applied Physics Lab (Virtual Lab)	-	-	3	1.5	40	60
7	Python Programming Lab	-	-	3	1.5	40	60
8	Engineering Workshop and IT Workshop	-	-	3	1.5	40	60
9	Constitution of India / Essence of Indian Traditional Knowledge	3	-	-	-	0	0
<b>Total</b>		<b>14</b>	<b>1</b>	<b>12</b>	<b>18</b>	<b>320</b>	<b>480</b>
						<b>800</b>	

<b>II YEAR I SEMESTER</b>							
<b>S.No</b>	<b>Subject</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>I</b>	<b>E</b>
1	Software Engineering	3	-	-	3	40	60
2	Discrete Mathematical Structures	2	1	-	3	40	60
3	AI Tools, Techniques & Applications	3	-	-	3	40	60
4	Data Structures& Algorithms	3	-	-	3	40	60
5	Digital Logic Design	3	-	-	3	40	60
6	Object Oriented Programming through Java	3	-	-	3	40	60
7	Quantitative Aptitude I	3	-	-	-	-	-
8	AI Tools, Techniques & Applications Lab	-	-	3	1.5	40	60
9	DS Lab	-	-	3	1.5	40	60
10	OOPS through Java Lab	-	-	3	1.5	40	60
<b>Total</b>		<b>20</b>	<b>1</b>	<b>9</b>	<b>22.5</b>	<b>360</b>	<b>540</b>
						<b>900</b>	
<b>II YEAR II SEMESTER</b>							
<b>S.No</b>	<b>Subject</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>I</b>	<b>E</b>
1	Internet of Things (IOT)	3	-	-	3	40	60
2	Design Thinking & Product Innovation	2	-	-	2	40	60
3	Database Management Systems	3	-	-	3	40	60
4	Formal Language Automata Theory	3	-	-	3	40	60
5	Computer Organization and Architecture	3	-	-	3	40	60
6	Logical Reasoning	2	-	-	1.5	20	30
7	Socially Relevant Project (15 Hrs/Sem)	-	-	1	0.5	20	30
8	Business English Communication Lab	-	-	3	1.5	40	60
9	Design Thinking & Product Innovation Lab	-	-	2	1	40	60
10	DBMS Lab	-	-	3	1.5	40	60
11	IOT Lab	-	-	3	1.5	40	60
<b>Total</b>		<b>16</b>	<b>0</b>	<b>12</b>	<b>21.5</b>	<b>400</b>	<b>600</b>
						<b>1000</b>	

<b>III YEAR I SEMESTER</b>							
<b>S.No</b>	<b>Subject</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>I</b>	<b>E</b>
1	Computer Networks	3	-	-	3	40	60
2	Operating Systems	3	-	-	3	40	60
3	Compiler Design	3	-	-	3	40	60
<b>Professional Elective I</b>							
4	1. Software Testing Methodologies	3			3	40	60
	2. Data Science						
	3. Full Stack Web Development						
	4. Human Computer Interaction						
<b>Open Elective I (Inter Disciplinary Elective I)</b>							
5	1. Principles of Communication Systems	3	-	-	3	40	60
	2. Robotics						
	3. Embedded Systems						
	4. Statistics with R Programming						
	5. Electronic Devices and Circuits(EDC)						
6	Mathematic-III (Differential Calculus and Number Theory & Applications)	2	1	-	3	40	60
7	Socially Relevant Projects (15 Hrs /Sem)	-	-	1	0.5	20	30
8	Quantitative Aptitude II	2	-	-	1	20	30
9	PE-I Lab	-	-	3	1.5	40	60
10	CN Lab	-	-	3	1.5	40	60
11	OS & CD Lab	-	-	3	1.5	40	60
<b>Total</b>		<b>19</b>	<b>1</b>	<b>10</b>	<b>24</b>	<b>400</b>	<b>600</b>
						<b>1000</b>	

<b>III YEAR II SEMESTER</b>							
<b>S.No</b>	<b>Subject</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>I</b>	<b>E</b>
1	Advanced Java & Web Technologies	3	1	-	4	40	60
2	Unix & Shell Programming	3	-	-	3	40	60
3	Design and Analysis of Algorithms	3	-	-	3	40	60
<b>Professional Elective II</b>							
4	1. Software Project Management	3	-	-	3	40	60
	2. Machine Learning						
	3. NoSQL Databases						
	4. Computer Graphics & 3D Design						
<b>Humanities Elective I</b>							
5	1. Management Science	3	-	-	3	40	60
	2. Life Sciences for Engineering						
	3. Foreign Language						
6	AJWT Lab	-	-	3	1.5	40	60
7	Unix & Shell programming Lab	-	-	3	1.5	40	60
8	Advanced English Communication Skills Lab	-	-	3	1.5	40	60
9	Socially Relevant Projects (15 hrs / semester)	-	-	1	0.5	20	30
10	Industrial Training/ Internship/ Research Projects in National Laboratories/Academic Institutions *	-	-	-	-	-	-
<b>Total</b>		<b>15</b>	<b>1</b>	<b>10</b>	<b>21</b>	<b>340</b>	<b>510</b>
						<b>850</b>	



IV YEAR I SEMESTER							
S.No	Subject	L	T	P	C	I	E
1	Network Security and Cryptography	3	-	-	3	40	60
<b>Professional Elective III</b>							
2	1. Software Architectures	3	-	-	3	40	60
	2. Natural Language Processing						
	3. Dev Ops						
	4. Augmented Reality and Virtual Reality						
<b>Professional Elective IV</b>							
3	1. UML & DP	3	-	-	3	40	60
	2. Big Data Analytics						
	3. Web Services						
	4. Game Development						
<b>Open Elective II</b>							
4	1. Digital Image Processing	3	-	-	3	40	60
	2. Green Building Technologies						
	3. Information Theory and Coding						
	4. Principles of Signal Processing						
	5. MAT LAB Programming and ML Tool Box						
<b>Humanities Elective II</b>							
5	1. Managerial Economics and Financial Analysis	3	-	-	3	40	60
	2. IPRP						
	3. Education, Technology and Society						
6	Network Security Lab	-	-	3	1.5	40	60
7	PE-IV Lab	-	-	3	1.5	40	60
8	Project I (Mini Project)	-	-	2	1	20	30
9	Industrial Training/Internship/Research Projects in National Laboratories/Academic Institutions	-	-	-	2	20	30
<b>Total</b>		<b>15</b>	<b>0</b>	<b>10</b>	<b>21</b>	<b>320</b>	<b>480</b>
						<b>800</b>	

IV YEAR II SEMESTER							
S.No	Subject	L	T	P	C	I	E
<b>Open Elective III/ MOOC *</b>							
1	1 Wireless Sensor Networks	3	-	-	3	40	60
	2 Nano Technology						
	3 Electronic Measurements and Instrumentation						
	4. Speech Processing						
	5. Operations Research						
<b>Professional Elective V / MOOC*</b>							
2	1. Real-Time Systems	3	-	-	3	40	60
	2. Deep Learning						
	3. Mobile Application Development						
	4. Block Chain Technologies						
3	Project II	-	-	14	7	80	120
<b>Total</b>		<b>3</b>	<b>0</b>	<b>14</b>	<b>13</b>	<b>160</b>	<b>240</b>
						<b>400</b>	

**I YEAR I SEMESTER  
INFORMATION TECHNOLOGY  
R19 SYLLABUS**

<b>Subject</b>	<b>Mathematics-I (Linear Algebra &amp; Calculus)</b>				
<b>Year/Semester</b>	<b>I B.Tech./I Sem</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Regulation Year</b>	<b>2019-20</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>

**COURSE OBJECTIVES:** To enable the students to

1. know the importance of matrices to solve linear equations using matrices
2. identify and solve various differential equations using corresponding methods
3. apply methods of solving higher order linear differential equations
4. comprehend the theory of maxima and minima of a function of two variables.
5. analyze the techniques of tracing the curves and evaluate the lengths, areas, volumes of objects using multiple integrals

### **UNIT –I: Matrices - Linear system of equations**

Introduction, Different types of matrices, Rank-Echelon form - Normal form, Solution of a System of Linear Equations – Non-homogeneous and homogeneous equations, Gauss- Jordan method, Gauss – Elimination Method, LU Decomposition, Applications of electric circuits.

### **.Unit- II: Eigen values - Eigen vectors**

Eigen values - Eigen vectors – Properties– Cayley-Hamilton Theorem - finding inverse and power of a matrix by using Cayley-Hamilton theorem, Diagonalization of matrices, Spectral Decomposition, Principal Component Analysis and Singular Value Decomposition

### **.UNIT –III: Differential Equations of First Order and First Degree**

Differential equations of first order and first degree–Exact and Non-exact differential equations, Linear and Bernoulli differential equations. Orthogonal trajectories, Newton’s Law of cooling, Law of natural growth and decay, L-R and R-C Circuits.

### **UNIT –IV: Linear Differential Equations of Higher Order**

Higher order homogenous and non - homogenous linear differential equations with constant coefficients - Particular integrals for the functions of type  $e^{ax}$ ,  $\sin(ax+b)$ ,  $\cos(ax+b)$ , Polynomial of  $x$ ,  $e^{ax} V(x)$ , L-C-R Circuits

### **Unit – V: Partial Differentiation**

Functions of several variables- Partial derivatives, Total derivative, Chain rule, Change of variables, Jacobians, Functional dependence. Generalized Mean Value theorem –Taylor’s theorem and Maclaurin’s theorem (without proof) for a function of two variables, Maxima and Minima of functions of two variables, Lagrange’s method of undetermined multipliers

### **Unit –VI: Multiple Integrals and Applications**

Review of Curve tracing-Cartesian-Polar and Parametric curves  
Multiple integrals - double integrals - change of variables (Cartesian and Polar coordinates), Change of order of integration and Evaluation of triple integrals, computing area, surface areas and volume.

**Text Books:**

1. B. S. Grewal, Higher Engineering Mathematics, 42<sup>nd</sup>Ed., Khanna Publishers, New Delhi, 2012
2. Erwin .Kreyszig,Advanced Engineering Mathematics,9<sup>th</sup>Ed., Wiley, 2012

**References:**

1. T.K.V.Iyengar, B. Krishna Ghandhi, S. Ranganathan and M.V.S.S.N.Prasad, Engineering Mathematics, Volume-I, 12<sup>th</sup> Ed., S. Chand Publishers, 2014
2. B. V. Ramana, Engineering Mathematics, 4<sup>th</sup> Ed., Tata McGraw Hill, New Delhi, 2009
3. D. S. Chandrashekharaiyah, Engineering Mathematics, Volume 1, Prism Publishers, 2010
4. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, reprint, 2008.

**COURSE OUTCOMES:**

After completing this course, the students will be able to

- 1.Solve linear system of equations in engineering problems
2. Find Eigenvalues and Eigenvectors of a matrix in engineering studies.
3. Model engineering problems as differential equations and solve analytically.
4. Model engineering problems as a differential equations and solve analytically the higher order differential equations.
5. Find out local /global optimum of functions of several variables.
6. Compute areas, surface areas and volumes.

Subject	Applied Chemistry				
Year/Semester	I B. Tech/I Sem	L	T	P	C
Regulation Year	2019-20	3	0	0	3

### COURSE OBJECTIVES:

- Plastics are nowadays used in household appliances; also they are used as composites in aerospace industries.
- Fuels as a source of energy are a basic need of any industry, particularly industries like thermal power stations, steel industry, fertilizer industry etc., and hence they are introduced.
- The basics for the construction of galvanic cells. Also if corrosion is to be controlled, one has to understand the mechanism of corrosion which itself is explained by electrochemical theory.
- With the increase in demand, a wide variety of materials are coming up; some of them have excellent engineering properties and these materials are introduced.
- Understanding of crystal structures will help to understand the conductivity, semiconductors and superconductors.
- With the increase in demand for power and also with depleting sources of fossil fuels, the demand for alternative sources of fuels is increasing. Some of the prospective fuel sources are introduced.

### UNIT I: HIGH POLYMERS AND PLASTICS

Polymerization : Introduction- Methods of polymerization --Thermoplastics and Thermosetting plastics – Compounding and fabrication (4/5 techniques)- Preparation, properties and applications of polyethylene, PVC, Bakelite Teflon. Conducting polymers, Fiber Reinforced Plastics and Biodegradable Polymers.

Elastomers – Natural rubber - vulcanization – Synthetic rubbers : Buna S, Buna N and Thiokol – Applications of elastomers.

### UNIT II: FUEL TECHNOLOGY

**Fuels:-** Introduction – Calorific value - HCV and LCV – Bomb calorimeter – Numerical problems – Coal — Proximate and ultimate analysis –Significance of the analyses – Liquid fuels – Petroleum- Refining – Cracking – Petrol knocking – Diesel knocking - Octane and Cetane ratings – Anti-knock agents –Gaseous fuels – Natural gas, LPG and CNG. – Biofuels- Biodiesel and Power alcohol

### UNIT III: ELECTROCHEMICAL CELLS AND CORROSION

Galvanic cells (Construction and working) – Electro chemical series and uses of this series- Standard electrodes (Hydrogen and Calomel electrodes) Batteries: Dry Leclanche Cell - Ni-Cd cells - Li cells.

**Corrosion:-** Definition – Theories of Corrosion (dry & wet corrosion) – Formation of galvanic cells by different metals, differential aeration - waterline corrosion – Pitting corrosion - Factors which influence the rate of corrosion - Protection from corrosion: Methods of application on metals (Galvanizing, Tinning, Electroplating, Electroless plating)

#### **UNIT IV: CHEMISTRY OF ADVANCED MATERIALS**

**Nano materials:-** Introduction – Bottom up and Top down approach- Sol gel method- Self assembled layers Characterisation of nano materials by BET and TEM - Carbon nano tubes and fullerenes: Types, Preparation (Arc discharge and Laser ablation and Chemical Vapour Deposition methods) properties and applications

**Liquid crystals: -** Introduction – Types – Applications

**Superconductors: -** Type-I& Type-II, properties & applications.

**Green synthesis: -** Principles – Aqueous phase method, Super critical fluid Extraction method and Bio catalytic methods of synthesis-Applications.

#### **UNIT V: SOLID STATE CHEMISTRY**

Types of solids – Crystal defects- Frenkel and Schottky defects – Spinel and Inverse spinel. Hall effect and applications.

**Semiconductors:** Preparation of pure semiconductors by Zone refining, distillation and Czochralski crystal pulling technique- Doping- Epitaxy, diffusion and Ion implantation technique- Intrinsic and Extrinsic semiconductors - Applications.

**Insulators :** Electrical Insulators and their applications.

#### **UNIT VI: NON CONVENTIONAL ENERGY SOURCES**

**Solar Energy: -** Introduction, application of solar energy – photovoltaic cell: design, working and its importance.

**Non-conventional energy sources:**

(i) Hydropower include setup a hydropower plant (schematic diagram)

(ii) Geothermal energy: Introduction-schematic diagram of a geothermal power plant

(iii) Tidal and wave power: Introduction- Design and working-movement of tides and their effect on sea level.

(iv) Biomass energy

**Fuel cells: -** Introduction - cell representation, H<sub>2</sub>-O<sub>2</sub> fuel cell: Design and working, advantages and limitations. Types of fuel cells: methanol-oxygen - phosphoric acid fuel cells.

#### **Text Books:**

1. Engineering Chemistry by Jain and Jain; Dhanpat Rai Publishing Co.
2. Engineering Chemistry by Shikha Agarwal; Cambridge University Press, 2015 edition.
- 3.

#### **Reference Books:**

1. Engineering Chemistry by PrasanthRath, Cengage Learning, 2015 edition.
2. A text book of engineering Chemistry by S. S. Dara; S. Chand & Co Ltd., Latest Edition.

#### **COURSE OUTCOMES:**

1. The advantages and limitations of plastic materials and their use in design would be understood.
2. Fuels which are used commonly and their economics, advantages and limitations are discussed.
3. Reasons for corrosion and some methods of corrosion control would be understood.
4. The students would be now aware of materials like nano-materials and fullerenes and their uses. Similarly liquid crystals and superconductors are understood. The importance

of green synthesis is well understood and how they are different from conventional methods is also explained.

5. Conductance phenomenon is better understood.
6. The students are exposed to some of the alternative fuels and their advantages and limitations.



Subject	Computer Programming Using C				
Year/Semester	I B. Tech/I Sem	L	T	P	C
Regulation Year	2019-20	3	0	0	3

### COURSE OBJECTIVES:

- Formulating algorithmic solutions to problems and implementing algorithms in C.
- Notion of Operation of a CPU, Notion of an algorithm and computational procedure, editing and executing programs in Linux.
- Understanding branching, iteration and data representation using arrays.
- Modular programming and recursive solution formulation.
- Understanding pointers and dynamic memory allocation.
- Understanding miscellaneous aspects of C.

### UNIT-I:

#### Fundamentals of Computer and Computational thinking:

Computer Block Diagram, Computer Hardware, Data Representation in Memory, components, Programming Languages - Machine Language, Assembly Language, Low- and High-Level Languages, Procedural and Object-Oriented Languages, Application and System Software, Translators, Algorithms, Flowcharts, The Software Development Process.

### UNIT-II:

**Introduction to C Programming-** Identifiers, The main () Function, The printf () Function **Programming Style** - Indentation, Comments, Data Types, Arithmetic Operations, Expression Types, Variables and Declarations, Negation, Operator Precedence and Associativity, Declaration Statements, Initialization.

**Assignment** - Implicit Type Conversions, Explicit Type Conversions (Casts), Assignment Variations, Mathematical Library Functions, Interactive Input, Formatted Output, Format Modifiers.

### UNIT-III:

#### Control Flow-Relational Expressions - Logical Operators:

**Selection:** if-else Statement, nested if, examples, Multi-way selection: switch, else-if, examples.

**Repetition:** Basic Loop Structures, Pretest and Posttest Loops, Counter-Controlled and Condition-Controlled Loops, The while Statement, The for Statement, Nested Loops, The do-while Statement.

### UNIT-IV:

#### Arrays & Pointers:

**Arrays:** One-Dimensional Arrays, Input and Output of Array Values, Array Initialization, Two-Dimensional Arrays, Larger Dimensional Arrays- Matrices

**Pointers:** Concept of a Pointer, Initialisation of pointer variables, passing by address, Dangling memory, address arithmetic, Dynamic memory management functions, command line arguments.

### UNIT-V:

**Modular Programming:** Function and Parameter Declarations, Returning a Value, Classifications of Functions, Variable Scope, Variable Storage Class, Local Variable Storage Classes, Global Variable Storage Classes, Pass by Reference, Passing Addresses to a Function, Array as a Function arguments.

Case Study: Recursion - Mathematical Recursion, Recursion versus Iteration

**UNIT-VI:****Strings & Structures:**

**Strings:** String Fundamentals, String Input and Output, String Processing, Library Functions.

**Structures:** Derived types, Structures declaration, Initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self-referential structures, unions, typedef, bit-fields.

**TEXT BOOKS:**

1. ANSI C Programming, Gary J. Bronson, Cengage Learning.
2. Let us C Authentic Guide to C Programming Language by yashavantkanetkar.
3. The C programming Language, Dennis Richie and Brian Kernighan, Pearson Education.

**REFERENCE BOOKS:**

1. C Programming-A Problem Solving Approach, Forouzan, Gilberg, Cengage.
2. Programming with C, Bichkar, Universities Press.
3. Programming in C, Reema Thareja, OXFORD.
4. C by Example, Noel Kalicharan, Cambridge.

**COURSE OUTCOMES:**

1. Understand the basic terminology used in computer programming
2. Write, compile and debug programs in C language.
3. Use different data types in a computer program.
4. Design programs involving decision structures, loops and functions.
5. Explain the difference between call by value and call by reference
6. Understand the dynamics of memory by the use of pointers
7. Use different data structures and Strings.

Subject	Elements of Electrical & Electronics Engineering				
Year/Semester	I B. Tech/I Sem	L	T	P	C
Regulation Year	2019-20	3	0	0	3

### **COURSE OBJECTIVES:**

This course covers the topics related to analysis of various electrical circuits, operation of various electrical machines, various electronic components to perform well in their respective fields.

Learning Objectives:

- 1 To learn the basic principles of electrical law's and analysis of networks.
- 2 To understand the principle of operation and construction details of DC machines.
- 3 To understand the principle of operation and construction details of transformer.
- 4 To study the operation of PN junction diode, half wave, full wave rectifiers and OP-AMPs.
- 5 To learn the operation of PNP and NPN transistors and various amplifiers.

### **UNIT - I**

DC Circuits: Electrical circuit elements (R - L and C) - Ohm's-Law, Kirchhoff laws - Series and parallel connection of resistances with DC excitation. Mesh Analysis and Nodal Analysis. Superposition Theorem

### **UNIT - II**

AC Circuits : Representation of sinusoidal waveforms - peak and rms values - phasor representation - real power - reactive power - apparent power - power factor - Analysis of single-phase ac circuits consisting of RL - RC - RLC series circuits.

### **UNIT - III**

DC Machines: Principle and operation of DC Generator - EMF equations - OCC characteristics of DC generator – principle and operation of DC Motor – Performance Characteristics of DC Motor - Speed control of DC Motor

### **UNIT - IV**

AC MACHINES: Principle and operation of Single Phase Transformer - OC and SC test on transformer - principle and operation of Induction Motor [ Elementary treatment only ]

### **UNIT V**

RECTIFIERS & LINEAR ICs: PN junction diodes, diode applications (Half wave and bridge rectifiers). Characteristics of operation amplifiers (OP- AMP) - application of OP-AMPs (inverting, non inverting, integrator and differentiator).

### **UNIT VI**

TRANSISTORS: PNP and NPN junction transistor, transistor as an amplifier, single stage CE Amplifier, frequency response of CE amplifier, concepts of feedback amplifier.

**TEXT BOOKS:**

1. Electronic Devices and Circuits, R.L. Boylestad and Louis Nashelsky, 9th edition, PEI/PHI 2006.
2. Electrical Technology by Surinder Pal Bali, Pearson Publications.
3. Electrical Circuit Theory and Technology by John Bird, Routledge Taylor & Francis Group

**REFERENCE BOOKS:**

1. Basic Electrical Engineering by M.S.Naidu and S.Kamakshiah, TMH Publications.
2. Fundamentals of Electrical Engineering by Rajendra Prasad, PHI Publications, 2nd edition.
3. Basic Electrical Engineering by Nagsarkar, Sukhija, Oxford Publications, 2nd edition.
4. Industrial Electronics by G.K. Mittal, PHI.

**COURSE OUTCOMES:**

1. Able to analyse the various electrical networks.
2. Able to understand the operation of DC generators, 3-point starter and conduct the Swinburne's Test.
3. Able to analyse the performance of transformer.
4. Able to analyse the operation of half wave, full wave rectifiers and OP- AMPS.
5. Able to explain the single stage CE amplifier and concept of feedback amplifier.

<b>Subject</b>	<b>Engineering Graphics &amp; Design</b>				
<b>Year/Semester</b>	<b>I B. Tech/I Sem</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Regulation Year</b>	<b>2019-20</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>2.5</b>

### COURSE OBJECTIVES:

Engineering drawing being the principle method of communication for engineers, the objective is to introduce the students, the techniques of constructing the various types of polygons, curves and scales.

The objective is also to visualize and represent the 3D objects in 2D planes with proper dimensioning, scaling etc.

### UNIT I

**Objective:** To introduce the students to use drawing instruments and to draw polygons, Engg. Curves.

**Polygons:** Construction of regular polygons by general methods, inscribing and describing polygons on circles.

**Curves:** Ellipse, Parabola and Hyperbola by general methods, Tangent & Normal and Ellipse by Oblong Method and Arcs of Circles Method

### UNIT II

**Objective:** To introduce the students to use scales and orthographic projections, projections of points & simple lines.

**Scales:** Plain scale, Diagonal scale and Vernier scale.

**Orthographic Projections:** Introduction to Projections, Horizontal plane, Vertical plane, Profile plane, importance of reference lines.

**Projections of points** in various quadrants.

### UNIT III

**Objective:** The objective is to make the students draw the projections of the lines inclined to both the planes.

**Projections of straight lines** inclined to one plane, inclined to both the planes, traces

### UNIT IV

**Objective:** The objective is to make the students draw the projections of the plane inclined to both the planes.

**Projections of planes:** inclined to one reference plane; inclined to both the reference planes.

### UNIT V

**Objective:** The objective is to make the students draw the projections of the various types of solids in different positions inclined to one of the planes.

**Projections of Solids** – Projections of Prisms, Pyramids, Cones and Cylinders simple positions, the axis inclined to one of the reference planes.

### UNIT VI

**Objective:** The objective is to represent the object in 3D view through isometric views. The student will be able to represent and convert the isometric view to orthographic view and vice versa.

Conversion of isometric views to orthographic views;

Conversion of orthographic views to isometric views.

**TEXT BOOKS:**

1. Engineering Drawing by N.D. Bhatt, Charotar Publishing House Pvt. Ltd
2. Engineering Drawing by Agarwal & Agarwal, Tata McGraw Hill
3. Engineering Drawing + AutoCAD by K. Venugopal, V. Prabhu Raja, New Age

**REFERENCE BOOKS:**

1. Engineering Drawing by K.L.Narayana& P. Kannaiah, Scitech Publications
2. Engineering Graphics for Degree by K.C. John, PHI Learning
3. Engineering Graphics by PI Varghese, McGrawHill Publishers.
4. Engineering Drawing by P.S. Gill, S.K. Kataria& Sons
5. Engineering Drawing by Venkata Reddy – B.S. Publications.

**COURSE OUTCOMES:**

Upon successful completion of this course, the student shall be able to:

1. Understand and construct the polygons and curves in engineering applications.
2. Visualize objects in 3D space and draw Orthographic Projections.
3. Interpret Orthographic and Isometric views of objects.

Subject	Applied Chemistry Lab				
Year/Semester	I B. Tech/I Sem	L	T	P	C
Regulation Year	2019-20	0	0	3	1.5

### List of Experiments:

1. Trial experiment - Determination of HCl using standard  $\text{Na}_2\text{CO}_3$  solution.
2. Determination of alkalinity of a sample containing  $\text{Na}_2\text{CO}_3$  and NaOH.
3. Determination of  $\text{KMnO}_4$  using standard Oxalic acid solution.
4. Determination of Copper using standard  $\text{K}_2\text{Cr}_2\text{O}_7$  solution.
5. Determination of temporary and permanent hardness of water using standard EDTA solution.
6. Determination of Vitamin – C
7. Determination of  $\text{P}^{\text{H}}$  of the given sample solution using  $\text{P}^{\text{H}}$  meter.
8. Conductometric titration between strong acid and strong base.
9. Potentiometric titration between strong acid and strong base.
10. Estimation of copper by Colorometry
11. Estimation of KCl by Ion exchange resin method.
12. Photo Chemical Reduction of Ferric Salt (Blue-Printing)
13. Adsorption of acetic acid on charcoal.
14. Determination of rate of corrosion.
15. Preparation of a polymer.

### Reference Books:

1. A Textbook of Quantitative Analysis, Arthur J. Vogel.
2. Dr. Jyotsna Cherukuris (2012), Laboratory Manual of Engineering Chemistry-II, VGS
3. Techno Series
4. Chemistry Practical Manual, Lorven Publications
5. Practical Engineering Chemistry, K. Mukkanti (2009), B.S. Publication

### COURSE OUTCOMES:

1. The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations;
2. Exposed to a few instrumental methods of chemical analysis.
3. The student is exposed to different methods of chemical analysis and use of some commonly employed instruments.
4. Conductance phenomenon is better understood.

<b>Subject</b>	<b>Computer Programming Lab</b>				
<b>Year/Semester</b>	<b>I B. Tech/I Sem</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Regulation Year</b>	<b>2019-20</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>

### **COURSE OBJECTIVES:**

- Understand the basic concept of C Programming, and its different modules that includes conditional and looping expressions, Arrays, Strings, Functions, Pointers Structures.
- Acquire knowledge about the basic concept of writing a program.
- Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
- Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
- Role of functions involving the idea of Modularity.

### **Exercise - 1 Basics**

- What is an OS Command, Familiarization of Editors - vi, Emacs
- Using commands like mkdir, ls, cp, mv, cat, pwd, and man
- C Program to Perform Adding, Subtraction, Multiplication and Division of two numbers From Command line

### **Exercise - 2 Basic Math**

- Write a C Program to Simulate 3 Laws at Motion
- Write a C Program to convert Celsius to Fahrenheit and vice versa

### **Exercise - 3 Control Flow – I**

- Write a C Program to Find Whether the Given Year is a Leap Year or not.
- Write a C Program to Add Digits & Multiplication of a number

### **Exercise – 4 Control Flow – II**

- Write a C Program to Find Whether the Given Number is
  - Prime Number
  - Armstrong Number
- Write a C program to print Floyd Triangle
- Write a C Program to print Pascal Triangle

### **Exercise – 5 Functions**

- Write a C Program demonstrating of parameter passing in Functions and returning values.
- Write a C Program illustrating Fibonacci, Factorial with Recursion without Recursion

### **Exercise – 6 Control Flow – III**

- Write a C Program to make a simple Calculator to Add, Subtract, Multiply or Divide Using switch...case
- Write a C Program to convert decimal to binary and hex (using switch call function the function)



### **Exercise – 7 Functions – Continued**

Write a C Program to compute the values of  $\sin x$  and  $\cos x$  and  $e^x$  values using Series expansion. (use factorial function)

### **Exercise – 8 Arrays**

Demonstration of arrays

- a) Search-Linear.
- b) Sorting-Bubble, Selection.
- c) Operations on Matrix.

### **Exercises - 9 Structures**

- a) Write a C Program to Store Information of a Movie Using Structure
- b) Write a C Program to Store Information Using Structures with Dynamically Memory Allocation
- c) Write a C Program to Add Two Complex Numbers by Passing Structure to a Function

### **Exercise - 10 Arrays and Pointers**

- a) Write a C Program to Access Elements of an Array Using Pointer
- b) Write a C Program to find the sum of numbers with arrays and pointers.

### **Exercise – 11 Dynamic Memory Allocations**

- a) Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using `malloc ()` function.
  - b) Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using `calloc ()` function.
- Understand the difference between the above two programs

### **Exercise – 12 Strings**

- a) Implementation of string manipulation operations with library function.
  - i) copy
  - ii) concatenate
  - iii) length
  - iv) compare
- b) Implementation of string manipulation operations without library function.
  - i) copy
  - ii) concatenate
  - iii) length
  - iv) compare

### **COURSE OUTCOMES:**

1. Apply and practice logical ability to solve the problem.
2. Understand C programming development environment, compiling, debugging and linking and executing a program using the development environment.
3. Analyzing the complexity of problems, modularize the problems into small modules and then convert them into programs.
4. Understand and apply the inbuilt functions and customized functions for solving the problems.
5. Understand and apply the pointers, memory allocation techniques.

<b>Subject</b>	<b>Electrical &amp; Electronics Engineering Lab</b>				
<b>Year/Semester</b>	<b>I B. Tech/I Sem</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Regulation Year</b>	<b>2019-20</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>

The following experiments are required to be conducted as compulsory experiments:

Section A: Electrical Engineering:

1. Verification of Kirchoffs Laws
2. Verification of Superposition Theorem.
3. Swinburne's test on D.C. Shunt machine (Predetermination of efficiency of a given D.C. Shunt machine working as motor and generator).
4. OC and SC tests on single phase transformer (Predetermination of efficiency and regulation at given power factors).
5. Speed control of D.C. Shunt motor by
  - a) Armature Voltage control
  - b) Field flux control method
6. Brake test on D.C. Shunt Motor.

Section B: Electronics Engineering:

1. PN junction Diode characteristics A. Forward bias, B. Reverse bias. (Cut in voltage & Resistance calculations)
2. Transistor CE Characteristics (Input and Output).
3. Full wave Rectifier with and without filters.
4. CE Amplifiers.

Subject	Environmental Science				
Year/Semester	I B. Tech/I Sem	L	T	P	C
Regulation Year	2019-20	3	0	0	0

### **COURSE OBJECTIVES:**

To make the students get awareness on environment, to understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day to day activities of human life to save earth from the inventions by the engineers.

#### **UNIT – I** Multidisciplinary nature of Environmental Science and Ecosystems.

Definition, Scope and Importance and sustainability – Need for public awareness- Human population and Environment.

Ecosystems: Concept of an ecosystem. - Structure and function of an ecosystem. – Types of ecosystems- Forest, Grassland, Desert and Aquatic ecosystems- Food chains, food webs and ecological pyramids.

#### **UNIT – II** Natural Resources

Forest resources: Use and over – exploitation, deforestation – Timber extraction – Mining, dams and other effects on forest and tribal people

Water resources: Conflicts over water, dams – benefits and problems

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

Energy resources: Growing energy needs- renewable and non-renewable energy sources.

Food resources – World food problems

Land resources- Wasteland reclamation.

Role of an individual in conservation of natural resources.

#### **UNIT – III** Biodiversity and its conservation

Definition: Genetic, species and ecosystem diversity- classification - Value of biodiversity: consumptive use, productive use, social - Biodiversity at national and local levels. Hot-spots of biodiversity - Threats to biodiversity - Endangered and endemic species of India - conservation of biodiversity.

#### **UNIT – IV** Environmental Pollution

Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards. Role of an individual in prevention of pollution. - Pollution case studies.

Solid Waste Management: Sources, effects and control measures of urban and industrial solid wastes.

Biomedical and e - waste management.

Global Environmental Challenges: Global warming and climate change, acid rains, ozone layer depletion.

#### **UNIT – V** Social Issues and the Environment

Urban problems related to energy -Water conservation, rain water harvesting-Resettlement and

rehabilitation of people. Environmental Protection Act –Air Act. –Water Act - Wildlife Protection Act -Forest Conservation Act- Public awareness.  
International protocols: Stockholm and Rio Summit, Kyoto protocol and Montreal protocol.

#### **UNIT – VI Environmental Management**

Impact Assessment and its significance - various stages of EIA- Environmental audit, Ecotourism.

The student Visit of an Industry / Ecosystem.

#### **TEXT BOOKS:**

1. A Textbook of Environmental Studies, Shaashi Chawla, TMH, New Delhi.
2. Textbook of Environmental Studies for Undergraduate Courses by ErachBharucha for University Grants Commission.
3. Environmental Studies, R. Rajagopalan, 2nd Edition, 2011, Oxford University Press.

#### **REFERENCE BOOKS:**

1. Environmental Studies, K. V. S. G. Murali Krishna, VGS Publishers, Vijayawad
2. Text Book of Environmental Studies, Deeshita Dave & P. UdayaBhaskar, Cengage Learning.
3. Text book of Environmental Science and Technology – Dr. M. AnjiReddy , BS Publications
4. Environment Studies, Anubha Kaushik, C P Kaushik, New Age International Publishers, 2014
5. Environmental Studies, P. N. Palanisamy, P. Manikandan, A. Geetha, and K. Manjula Rani; Pearson Education, Chennai

#### **COURSE OUTCOMES:**

Students will be able to

1. Articulate the basic structure, functions, and processes of key social systems affecting the environment.
2. Explain how Natural resources should be used.
3. Identify the threats to biodiversity.
4. Understand Causes, effects and control measures of environmental pollution.
5. Gain knowledge about watershed management and environmental ethics.
6. Gain a rigorous foundation in various scientific disciplines as they apply to environmental science, such as ecology, evolutionary biology, hydrology, and human behaviour.

**I YEAR II SEMESTER  
INFORMATION TECHNOLOGY  
R19 SYLLABUS**

Subject	Communicative English				
Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2019-20	2	0	0	2

### Introduction:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training the students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competence of the students of Engineering.

As far as the detailed textbook is concerned, the focus should be on the skills of listening, speaking, reading and writing.

Thus the stress in the syllabus is primarily on the development of communicative skills and fostering of ideas.

### COURSE OBJECTIVES:

- Adopt activity based teaching-learning methods to ensure that the learners would be engaged in the use of language both in the classroom and the laboratory sessions.
- Facilitate effective listening skills for better comprehension of academic lectures and English spoken by native speakers
- Focus on appropriate reading strategies for comprehension of various academic texts and authentic materials
- Help improve speaking skills through participation in activities such as role plays, discussions and structured talks/oral presentations
- Impart effective strategies for good writing and demonstrate the same in summarizing, writing well organized essays, record and report useful information
- Provide knowledge of grammatical structures and vocabulary and encourage their appropriate use in speech and writing

### Methodology:

1. The classes are to be learner-centered where the learners are to read the texts to get a comprehensive idea of those texts on their own with the help of the peer group and the teacher.
2. Integrated skill development methodology has to be adopted with focus on individual language skills as per the tasks/exercise.
3. The tasks/exercises at the end of each unit should be completed by the learners only and the teacher intervention is permitted as per the complexity of the task/exercise.
4. The teacher is expected to use supplementary material wherever necessary and also generate activities/tasks as per the requirement.
5. The teacher is permitted to use lecture method when a completely new concept is introduced in the class.

### Unit 1

(10 periods)

**Reading:** Skimming to get the main idea of a text

**Reading for Writing:** Beginnings and endings of paragraphs - introducing the topic, summarizing the main idea and/or providing a transition to the next paragraph.

**Grammar and Vocabulary :** Nouns and Pronouns; textual words

#### Learning Outcomes

At the end of the module, the learners will be able to

- employ suitable strategies for skimming to get the general idea of a text
- recognize paragraph structure with beginnings/endings
- using correct word forms of nouns and pronouns and textual words

### Unit 2

(10 periods)

**Reading:** Scanning to look for specific pieces of information.

**Writing:** Writing sentences with proper word order - Basic Sentence Structures

**Grammar and Vocabulary:** Verbs - tenses; use of synonyms

#### Learning Outcomes

At the end of the module, the learners will be able to

- Employ suitable strategies for scanning to identify specific information from a text
- Write accurately using proper grammatical structures

### Unit 3

(10 periods)

**Reading:** Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in a paragraph together.

**Writing:** Paragraph writing using suitable cohesive devices; mechanics of writing - punctuation, capital letters.

**Grammar and Vocabulary:** Cohesive devices - linkers, sign posts and transition signals; use of articles and zero article; prepositions; use of synonyms

#### Learning Outcomes

At the end of the module, the learners will be able to

- write well structured paragraphs
- understand the use of cohesive devices

**Assignment-I:** Each Student is required to present a report on a problem faced by individuals or the society with an analysis and possible solutions. He/she has to make an oral presentation of it in the class before the completion of MID-I Examination. It is mandatory for all the students. It is for Internal Assessment.

### Unit 4

(10 periods)

**Reading:** Note making; making notes from the text/material.

**Writing:** Types of Paragraph writing

**Grammar and Vocabulary :** Subject-verb agreement, Quantifying expressions - adjectives and adverbs; comparing and contrasting; degrees of comparison; use of antonyms

#### Learning Outcomes

At the end of the module, the learners will be able to

- make notes of the important information of a text
- understanding types of paragraphs
- use language appropriate adjective and adverbs for descriptions

## Unit 5

(10 periods)

**Reading:** Reading for comprehension.

**Writing:** Summarizing - identifying main idea/s and rephrasing what is read; avoiding redundancies and repetitions.

**Grammar and Vocabulary:** direct and indirect speech, reporting verbs for academic purposes.

### Learning Outcomes

At the end of the module, the learners will be able to

- write summaries based on global comprehension of reading/listening texts
- understand a paragraph

## Unit 6

(10 periods)

**Reading:** Studying the use of graphic elements in texts to convey information, reveal trends/patterns/relationships etc.

**Writing:** Information transfer; describe, compare, contrast, identify significance/trends based on information provided in figures/charts/graphs/tables.

**Grammar and Vocabulary:** Active Voice- Passive Voice; editing short texts – identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject verb agreement)

### Learning Outcomes

At the end of the module, the learners will be able to

- interpret data from the given charts/tables/graphs
- edit short texts by correcting common errors

**Assignment-II:** Each Student is required to present the information regarding one novel prescribed in course. He/she has to make an oral presentation of it in the class before the completion of MID-II Examination. It is mandatory for all the students. It is for Internal Assessment.

### Detailed Textbook:

Prescribed by JNTUK R19 for Reading and Writing

### Non-Detailed Textbook:

Wings of Fire: APJ Abdul Kalam

### Reference Books

1. Bailey, Stephen. Academic writing: A handbook for international students. Routledge, 2014.
2. Chase, Becky Tarver. Pathways: Listening, Speaking and Critical Thinking. Heinley ELT; 2nd Edition, 2018.
3. Skillful Level 2 Reading & Writing Student's Book Pack (B1) Macmillan Educational.
4. Hewings, Martin. Cambridge Academic English (B2). CUP, 2012.

### COURSE OUTCOMES:

At the end of the course, the learners will be able to

- identify the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English



- formulate sentences using proper grammatical structures and correct word forms
- speak clearly on a specific topic using suitable discourse markers in informal discussions
- write summaries based on global comprehension of reading/listening texts
- produce a coherent paragraph interpreting a figure/graph/chart/table
- take notes while listening to a talk/lecture to answer questions

### **Sample Web Resources**

#### *Grammar/Listening/Writing*

1-language.com

<http://www.5minuteenglish.com/>

<https://www.englishpractice.com/>

#### *Grammar/Vocabulary*

English Language Learning Online

<http://www.bbc.co.uk/learningenglish/>

<http://www.better-english.com/>

<http://www.nonstopenglish.com/>

<https://www.vocabulary.com/>

BBC Vocabulary Games

Free Rice Vocabulary Game

#### *Reading*

<https://www.usingenglish.com/comprehension/>

<https://www.englishclub.com/reading/short-stories.htm>

<https://www.english-online.at/>

#### *Listening*

<https://learningenglish.voanews.com/z/3613>

<http://www.englishmedialab.com/listening.html>

#### *Speaking*

<https://www.talkenglish.com/BBC Learning English – Pronunciation tips>

Merriam-Webster – Perfect pronunciation Exercises

#### *All Skills*

<https://www.englishclub.com/>

<http://www.world-english.org/>

<http://learnenglish.britishcouncil.org/>

#### *Online Dictionaries*

Cambridge dictionary online

MacMillan dictionary

Oxford learner's dictionaries

<b>Subject</b>	<b>Mathematics-II (Probability and Statistics)</b>				
<b>Year/Semester</b>	<b>I B. Tech/I Sem</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Regulation Year</b>	<b>2019-20</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>

**COURSE OBJECTIVES:**

Enable the students to

1. familiarize the foundations of probability and statistical methods
2. impart probability concepts and statistical methods in various applications in engineering studies
3. know the Binomial and Poisson distributions for real data to compute probabilities, theoretical frequencies
4. make use of method of least squares to fit a best curve for the given data and apply the regression analysis to fit the curves
5. decide the null or alternative hypotheses using the suitable test statistic
6. draw the Control charts like X-bar, p and R-charts

**Unit-I: Descriptive statistics and methods for data science**

Data science, Statistics Introduction, Population vs Sample, Collection of data, primary and secondary data, Type of variables: dependent and independent Categorical and Continuous variables, Data visualization, Measures of Central tendency, Measures of Variability (spread or variance), Skewness, Kurtosis

**Unit-II: Introduction to Probability**

Probability, probability axioms, addition law and multiplicative law of probability, conditional probability, Baye’s theorem, random variables (discrete and continuous), properties, mathematical expectation.

**Unit-III: Probability Distributions**

Probability distribution - Binomial, Poisson approximation to the binomial distribution and normal distribution- properties, fitting of Binomial distribution, Poisson distribution.

**Unit-IV: Correlation & Regression**

Correlation and Regression: Simple Bivariate Correlation: Karl Pearson’s coefficient of correlation, Spearman’s Rank correlation coefficient.

Linear Regression - Regression lines, Regression coefficients, properties.

Non Linear Regression - Quadratic, Power and Exponential models.

**Unit-V: Tests of Hypothesis**

Null and Alternative Hypothesis, One tail and two tailed tests, Type I and Type II errors. Tests of hypothesis using Student’s t-distribution, F-test and  $\chi^2$  test goodness of fit.

**Unit-VI: Statistical Quality Control Methods**

Introduction- Methods for preparing control charts – problems, using X- bar, R charts, p chart, np chart

**Text Books:**

1. Miller and Friends, Probability and Statistics for Engineers, 7/e, Pearson, 2008.
2. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, 11/e, Sultan Chand & Sons Publications, 2012.

**References:**

1. T.S.R. Murthy, Probability and Statistics for engineers, 1<sup>st</sup> edition, BS Publications, 2018.
2. T.K.V.Iyengar, B. Krishna Ghandhi, S. Ranganathan and M.V.S.S.N.Prasad, Engineering Mathematics, Volume-I, 12<sup>th</sup> Ed., S. Chand Publishers, 2014
3. B. V. Ramana, Engineering Mathematics, 4<sup>th</sup> Ed., Tata McGraw Hill, New Delhi, 2009
4. S. Ross, a First Course in Probability, Pearson Education India, 2002.

**COURSE OUTCOMES:**

Upon completing this course, the student should be able to

1. compute descriptive statistics and interpret in data science problems
2. compute probability and conditional probability of events for data sciences
3. compute probability distribution and fit problems to data
4. compute various linear and non linear regression models to the data
5. perform inferential statistics to test hypothesis
6. apply the methods of control charts like X-bar, R, p etc for quality control problems

Subject	Applied Physics				
Year/Semester	I B. Tech/IISem	L	T	P	C
Regulation Year	2019-20	3	0	0	3

### **COURSE OBJECTIVES:**

- To highlight the importance of physics concepts in Engineering & Technology.
- To facilitate the students with the aid of advanced insight in the applied science.
- To focus the real time applications of physics in engineering fields.
- To prepare the students to face the challenges in core fields with the support of physical principles.
- To motivate the students to understand the Engineering Principles through basic ideas in Physics.

### **UNIT-I: WAVE OPTICS**

Interference-Principle of Superposition-Interference of light-Theory of Interference fringes-Conditions for Sustained Interference -Interference in thin films (reflected light)-Newton's Rings-Determination of Wavelength. Diffraction- types of Diffraction, Fraunhofer Diffraction-Single slit, Double slit -Diffraction Grating -Determination of Wavelength. Polarization- types of polarized light, Polarization by reflection, refraction and double refraction-Nicol's prism-Half wave and Quarter wave plate- Engineering applications of Interference, Diffraction and Polarization.

### **UNIT-II: DIELECTRICS**

Introduction to Dielectrics--Electric polarization-Dielectric polarizability, Susceptibility and Dielectric constant- Types of polarizations with mathematical Derivations –Frequency dependence of polarization-Lorentz(internal) field-Claussius -Mosotti equation-Applications of Dielectrics.

### **UNIT-III: MAGNETIC MATERIALS**

Introduction -Magnetic dipole moment-Magnetization-Magnetic susceptibility and permeability-Origin of permanent magnetic moment -Classification of Magnetic materials-Weiss theory of ferromagnetism (qualitative)-Hysteresis-soft and hard magnetic materials-Ferrites-Magnetic device applications.

### **UNIT-IV: FIBER OPTICS**

Introduction to Optical Fibers-Total Internal Reflection- Construction of optical fibers - Acceptance angle-Numerical Aperture-Classification of fibers based on Refractive index profile, modes - Propagation of electromagnetic wave through optical fiber -l Applications -Block Diagram of Fiber optic Communication.

### **UNIT-V: SEMICONDUCTORS**

Origin of energy bands - Classification of solids based on energy bands – Intrinsic semiconductors - density of charge carriers-Fermi energy – Electrical conductivity – extrinsicsemiconductors - P-type & N-type - Density of charge carriers - Dependence of Fermi energy on carrier concentration and temperature- Direct and Indirect band gap semiconductors-Hall effect- Hall coefficient - Applications of Hall effect - Drift and Diffusion currents –

Einstein's equation - Applications of Semiconductors.

### **UNIT-VI: SUPERCONDUCTORS**

Introduction to Superconductors-Properties-Critical parameters of Superconductors- Meissner's effect-BCS Theory-Josephson effect (AC & DC)-Types of Superconductors-High T<sub>c</sub> Superconductors-SQUID- Superconductors Applications

#### **Text books:**

1. M.N. Avadhanulu, P.G.Kshirsagar "A Text book of Engineering Physics"- S.ChandPublications,2017
2. H.K.Malik&A.K.Singh "Engineering Physics",- McGraw Hill Publishing Company Ltd, 2018

#### **Reference Books:**

1. David J.Griffiths, "Introduction to Electrodynamics"- 4/e, Pearson Education,2014
2. Gerd Keiser "Optical Fiber Communications"- 4/e, Tata Mc GrawHill ,2008
3. Charles Kittel "Introduction to Solid State Physics",Wiley Publications,2011
4. S.M.Sze "Semiconductor devices-Physics and Technology"-Wiley,2008
5. T Pradeep "A Text book of Nano Science and Nano Technology"- Tata Mc GrawHill 2013

#### **COURSE OUTCOMES:**

Upon the completion of the course the students will be able to:

CO1: To interpret the interaction of energy with the matter.

CO2: To explain the concepts and applications of Dielectrics.

CO3: To classify the magnetic materials based on susceptibility and their temperature dependence.

CO4: To identify the applications of optical fibers in various fields.

CO5: Learn classification of semiconductors and their real time applications.

CO6: Understand the principle and background of superconductors

Subject	Python Programming				
Year/Semester	I B. Tech/IISem	L	T	P	C
Regulation Year	2019-20	3	0	0	3

### COURSE OBJECTIVES:

- Introduction to Scripting Language
- Exposure to various problems solving approaches of computer science

#### UNIT – I:

**Introduction:** History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation.

#### UNIT – II:

**Types, Operators and Expressions:** Types - Integers, Strings, Booleans; Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations Control Flow- if, if-elif-else, for, while, break, continue, pass

#### UNIT – III:

**Data Structures** Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences.Comprehensions.

#### UNIT – IV:

**Functions** - Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, FruitfulFunctions(Function Returning Values), Scope of the Variables in a Function - Global and Local Variables.

**Modules:** Creating modules, import statement, from. Import statement, name spacing.

**Python packages,** Introduction to PIP, Installing Packages via PIP, Using Python Packages

#### UNIT – V:

**Object Oriented Programming OOP in Python:** Classes, 'self variable', Methods, Constructor Method, Inheritance, Overriding Methods, and Data hiding.

**Error and Exceptions:** Difference between an error and Exception, Handling Exception, try-except block, Raising Exceptions, User Defined Exceptions

#### UNIT – VI:

**Brief Tour of the Standard Library** - Operating System Interface - String Pattern Matching, Mathematics, Internet Access, Dates and Times, Data Compression, Multithreading, GUI Programming, Turtle Graphics

**Testing:** Why testing is required?, Basic concepts of testing, Unit testing in Python, WritingTest cases, Running Tests.

**TEXT BOOKS**

1. Python Programming: A Modern Approach, VamsiKurama, Pearson
2. Learning Python, Mark Lutz, Orielly

**REFERENCE BOOKS:**

1. Think Python, Allen Downey, Green Tea Press
2. Core Python Programming, W.Chun, Pearson.
3. Introduction to Python, Kenneth A. Lambert, Cengage
4. Python Cookbook, O Reilly, David Beazley and Brain K. Jones

**COURSE OUTCOMES:**

- Making Software easily right out of the box.
- Experience with an interpreted Language.
- To build software for real needs.
- Prior Introduction to testing software

<b>Subject</b>	<b>English Communication Skills Lab</b>				
<b>Year/Semester</b>	<b>I B. Tech/II Sem</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Regulation Year</b>	<b>2019-20</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>

**COURSE OBJECTIVES:**

1. To sensitize the nuances of English speech sounds.
2. To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking.
3. To improve the fluency in spoken English in different contexts.
4. To demonstrate the synchronization of verbal and non verbal communication.
5. To speak with clarity and confidence.
6. To enrich the persuasive skills.

**MODULE – I**

**Listening:** Identifying the topic, the context and overall idea by listening to short audio texts and answering a series of questions.

Non Verbal Communication (2 sessions)

**MODULE – II**

**Listening:** Answering a series of questions about specific information after listening to audio texts.

Introduction to Phonetics – Sounds of English – Vowels and Consonants (3 sessions)

**MODULE – III**

**Listening:** Answering a series of questions about main idea and supporting ideas after listening to audio texts.

Reading with proper Stress and Intonation – Speech shadowing (3 sessions)

**MODULE– IV**

**Listening:** Listening for global comprehension and summarizing what is listened to.

Situational Dialogues/Role Plays, Just a Minute (4 sessions)

**MODULE– V**

Asking and answering general questions on familiar topics such as home, family, work, studies and interests; introducing oneself and others (2 sessions)

**MODULE – VI**

Formal oral presentations on topics from academic contexts - without the use of PPT slides. (3 sessions)

**INFRASTRUCTURE:**

1. 60 computer systems for a class of 60 students.
2. LAN facility and English Language Software for self-study by learners.
3. Audio System
4. Projector

**SYSTEM REQUIREMENT: Hardware Component**

1. P – IV Processor



2. Speed – 2.8 GHZ
3. RAM – 512 MB minimum
4. Hard Disk – 80 GB
5. Headphones of high quality

#### **SUGGESTED SOFTWARE**

1. Cambridge Advanced Learners‘ English Dictionary with CD.
2. Grammar Made Easy by Darling Kindersley
3. Punctuation Made Easy by Darling Kindersley
4. Clarity Pronunciation Power – Part I
5. Clarity Pronunciation Power – part II
6. Oxford Advanced Learner‘ s Compass, 7th Edition
7. DELTA ‘s key to the Next Generation TOEFL Test: Advanced Skill Practice.
8. MELL - K Van Solutions Software
9. TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
10. English in Mind (Series 1-4), Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge
11. English Pronunciation in Use, Cambridge University Press
12. Technical Communication, OUP
13. Communication Skills, OUP

#### **COURSE OUTCOMES**

The students will be able to:

1. Comprehend the importance of phonetics and interpret phonetic symbols, vowels and consonants.
2. Describe the speech sounds – vowels and consonants, stress and intonation.
3. Enable writing situational dialogues and enact Role Play.
4. Exemplify the synchronization of verbal and non verbal communication through the JAM session.
5. Enrich presentation skills through oral presentations - prepared and extempore.
6. Develop oratory skills through Debate.

#### **SUGGESTED READING**

1. Speaking English Effectively 2 nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
2. Sasi Kumar, V & Dhamija, P.V. How to Prepare for Group Discussion and Interviews. Tata McGraw Hill
3. Hancock, M. 2009. English Pronunciation in Use. Intermediate. Cambridge: CUP
4. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013 Orient Blackswan. Hyderabad.
5. Hewings, M. 2009. English Pronunciation in Use. Advanced. Cambridge: CUP
6. Marks, J. 2009. English Pronunciation in Use. Elementary. Cambridge: CUP
7. Nambiar, K.C. 2011. Speaking Accurately. A Course in International Communication. New Delhi Foundation
8. Soundararaj, Francis. 2012. Basics of Communication in English. New Delhi: Macmillan
9. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.
10. English Pronouncing Dictionary Daniel Jones Current Edition with CD.
11. A Text Book of English Phonetics for Indian Students by T. Balasubramanian (Macmillan)

<b>Subject</b>	<b>Applied Physics Lab</b>				
<b>Year/Semester</b>	<b>I B. Tech/IISem</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Regulation Year</b>	<b>2019-20</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>

### **List of Experiments:**

1. Determination of wavelength of a source-Diffraction Grating-Normal incidence
2. Newton's rings –Radius of Curvature of Plano Convex Lens.
3. Determination of thickness of a thin object using parallel interference fringes.
4. Determination/ of Rigidity modulus of a material- Torsional Pendulum.
5. Determination of Acceleration due to Gravity and Radius of Gyration- Compound Pendulum.
6. Melde's experiment – Transverse and Longitudinal modes.
7. Verification of laws of stretched string – Sonometer.
8. Determination of velocity of sound – Volume resonator.
9. L C R Series Resonance Circuit
10. Study of I/V Characteristics of Semiconductor diode
11. I/V characteristics of Zener diode
12. Thermistor characteristics – Temperature Coefficient
13. Magnetic field along the axis of a current carrying coil – Stewart and Gee's apparatus.
14. Energy Band gap of a Semiconductor p.n junction.
15. Hall Effect for semiconductor.

### **REFERENCE:**

1. Engineering Physics Lab Manual by Dr.Y. Aparna &Dr.K.Venkateswarao (V.G.S.Book links)
2. Physics Practical Manual, Lorven Publication.

Subject	Python Programming Lab				
Year/Semester	I B. Tech/IISem	L	T	P	C
Regulation Year	2019-20	0	0	3	1.5

### Exercise 1 – Basics

- Running instructions in Interactive interpreter and a Python Script
- Write a program to purposefully raise Indentation Error and correct it

### Exercise 2 – Operations

- Write a program to compute distance between two points taking input from the user (Pythagorean Theorem)
- Write a program add.py that takes 2 numbers as command line arguments and prints its sum.

### Exercise - 3 Control Flow

- Write a Program for checking whether the given number is a even number or not.
- What is sequence? Write a program using a for loop that loops over a sequence.
- Write a Program to print the multiplication table of a number using for loop.
- Write a program using a while loop to count the number of digits of a number.

### Exercise 4 - Control Flow – Continued

- Find the sum of all the primes below two million.  
Hint: Make use of sieve of erathosenes

#### b) Fibonacci series:

Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be:

1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...

By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.

Hint: Use recursive formula for even Fibonacci numbers.

### Exercise - 5 – DS

- Write a program to get unique values from list.
- Write a program to count the number of vowels in a string using sets.

### Exercise - 6 DS - Continued

- Write a program to count the numbers of characters (character frequency) in the string and store them in a dictionary data structure
- Write a program to use split and join methods in the string and trace a birthday with adictionary data structure.

### Exercise - 7 Files

- Write a program to print each line of a file in reverse order.
- Write a program to compute the number of characters, words and lines in a file.

### Exercise - 8 Functions

a) Write a function `ball_collide` that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding.

Hint: Represent a ball on a plane as a tuple of  $(x, y, r)$ ,  $r$  being the radius

If  $(\text{distance between two balls centers}) \leq (\text{sum of their radii})$  then (they are colliding)

b) Find mean, median, mode for the given set of numbers in a list.

### Exercise - 9 Functions – Continued

a) Write a function `nearly_equal` to test whether two strings are nearly equal. Two strings `a` and `b` are nearly equal when `a` can be generated by a single mutation on `b`.

b) Write a function `dups` to find all duplicates in the list.

### Exercise - 10 - Functions - Problem Solving

a) Write a function `cumulative_product` to compute cumulative product of a list of numbers.

b) Write a function `reverse` to reverse a list. Without using the reverse function.

c) Write function to compute gcd, lcm of two numbers. Each function shouldn't exceed one line.

### Exercise 11 - Multi-D Lists

a) Write a program that defines a matrix and prints

b) Write a program to perform addition of two square matrices

c) Write a program to perform multiplication of two square matrices

### Exercise - 12 – Modules

a) Install packages `requests`, `flask` and explore them. using `(pip)`

b) Write a script that imports `requests` and fetch content from the page. Eg. (Wiki)

c) Write a simple script that serves a simple `HTTPResponse` and a simple `HTML Page`

### Exercise - 13 OOP

a) Class variables and instance variable and illustration of the self variable

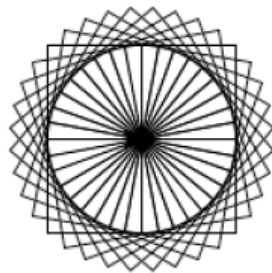
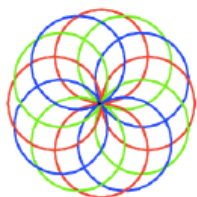
i) Robot

ii) Hospital Billing System

### Exercise - 14 GUI, Graphics

1. Write a GUI for an Expression Calculator using `tk`

2. Write a program to implement the following figures using `turtle`



**Exercise - 15 - Testing**

- a) Write a test-case to check the function `even_numbers` which return True on passing a list of all even numbers
- b) Write a test-case to check the function `reverse_string` which returns the reversed string

**Exercise - 16 - Advanced**

- a) Build any one classical data structure.
- b) Write a program to solve knapsack problem.

Subject	Engineering Workshop & IT Workshop				
Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2019-20	0	0	3	1.5

## IT WORKSHOP

### COURSE OBJECTIVES:

- Understand the basic components and peripherals of a computer.
- To become familiar in configuring a system.
- Learn the usage of productivity tools.
- Acquire knowledge about the netiquette and cyber hygiene.
- Get hands on experience in trouble shooting a system?

### LIST OF EXPERIMENTS

1. **System Assembling, Disassembling and identification of Parts / Peripherals**
2. **Operating System Installation**-Install Operating Systems like Windows, Linux along with necessary DeviceDrivers.
3. **MS-Office / Open Office**
  - a. **Word** - Formatting, Page Borders, Reviewing, Equations, symbols.
  - b. **Spread Sheet** - organize data, usage of formula, graphs, charts.
  - c. **Power point** - features of power point, guidelines for preparing an effective presentation.
  - d. **Access**- creation of database, validate data.
4. **Network Configuration & Software Installation**-Configuring TCP/IP, proxy and firewall settings. Installing application software, system software & tools.
5. **Internet and World Wide Web**-Search Engines, Types of search engines, netiquette, cyber hygiene.
6. **Trouble Shooting**-Hardware trouble shooting, Software trouble shooting.
7. **MATLAB**- basic commands, subroutines, graph plotting.
8. **LATEX**-basic formatting, handling equations and images.

### TEXT BOOKS:

1. Computer Hardware, Installation, Interfacing, Troubleshooting and Maintenance, K.L. James, Eastern Economy Edition.
2. Microsoft Office 2007: Introductory Concepts and Techniques, Windows XP Edition By Gary B. Shelly, Misty E. Vermaat and Thomas J. Cashman (2007, Paperback).
3. LATEX- User's Guide and Reference manual, Leslie Lamport, Pearson, LPE, 2/e.
4. Getting Started with MATLAB: A Quick Introduction for Scientists and Engineers, Rudraprathap, Oxford University Press, 2002.
5. Scott Mueller's Upgrading and Repairing PCs, 18/e, Scott. Mueller, QUE, Pearson, 2008
6. The Complete Computer upgrade and repair book, 3/e, Cheryl A Schmidt, Dreamtech.
7. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech.
8. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.

### **COURSE OUTCOMES:**

1. Apply knowledge for computer assembling and software installation.
2. Ability how to solve the trouble shooting problems.
3. Apply the tools for preparation of PPT, Documentation and budget sheet etc.

## **ENGINEERING WORKSHOP**

### **COURSE OBJECTIVES:**

**To impart hands-on practice on basic engineering trades and skills. Note: At least two exercises to be done from each trade.**

### **TRADES:**

#### **Fitting**

1. Vee Fit
2. Square Fit
3. Half Round Fit
4. Dovetail Fit

#### **Carpentry**

1. T-Lap Joint
2. Cross Lap Joint
3. Dovetail Joint
4. Mortise and Tenon Joint

#### **Tin Smithy**

1. Taper Tray
2. Square Box without lid
3. Open Scoop
4. Funnel

#### **Black Smithy**

1. Round rod to Square
2. S-Hook
3. Round Rod to Flat Ring
4. Round Rod to Square headed bolt

#### **House Wiring**

1. Parallel / Series Connection of three bulbs
2. Stair Case wiring
3. Florescent Lamp Fitting
4. Measurement of Earth Resistance

<b>Subject</b>	<b>Constitution of India</b>				
<b>Year/Semester</b>	<b>I B.Tech. / II Sem.</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Regulation Year</b>	<b>2019-20</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>

### **COURSE OBJECTIVES:**

- To train students in understanding the basic structure of Indian Constitution
- To prepare students to live better and happily with other fellow beings through the application of Fundamental Rights in their lives.

### **UNIT-I: Introduction to Indian Constitution**

Meaning of the term Indian Constitution –Preamble- Constituent Assembly- Salient Features of Indian Constitution

### **UNIT-II: Fundamental Rights**

Fundamental Rights -Fundamental Duties -The Directive Principles of State Policy

### **UNIT-III: Union Government**

Union Government -Union Legislature (Parliament) -Lok Sabha and Rajya Sabha (with Powers and Functions) -Union Executive -President of India (with Powers and Functions) -Prime Minister of India (with Powers and Functions) -Union Judiciary (Supreme Court) -Jurisdiction of the Supreme Court

### **UNIT-IV State Government**

State Government -State Legislature (Legislative Assembly / Vidhan Sabha, Legislative Council / Vidhan Parishad) -Powers and Functions of the State Legislature -State Executive-Governor of the State (with Powers and Functions) -The Chief Minister of the State (with Powers and Functions) -State Judiciary (High Courts)

### **UNIT-V: Local Self Governance**

Powers and functions of Municipalities, Panchyats, ZP's and Co – Operative Societies

### **UNIT-VI: Sovereign Bodies**

Election Commission of India (with Powers and Functions) -The Union Public Service Commission (with Powers and Functions)

### **BOOKS:**

1. Introduction to constitution of India, Durga Das Basu, Lexis Nexis Publications
2. Constitution of India by PROFESSIONAL BOOK PUBLISHERS
3. The Constitution of India by Arun K Tiruvengadam, Blooms bury publishers.
4. The constitution of India by PM Bakshi, Universal law publishing co
5. The Constitution of India by S.R. Bhansali, Universal Law publishing Co



**COURSE OUTCOMES:**

Upon the completion of the course, the student will be able to:

1. Examine salient features of Indian Constitution and live accordingly in society.
2. Interpret the meaning of Fundamental Rights and Directive Principles of State Policy and, develop an attitude which paves the way for better living conditions.
3. Discover various aspects of Union Government legislation and live up to the expectations of the rules.
4. Critically examine State Government legislation and improve your living standards by following the rules strictly
5. Examine powers and functions of local bodies such as Municipalities and Panchayats and, take advantage of available resources for better living
6. Analyze the powers and functions of Election Commission and The Union Public Service Commission and decide upon it for safe and secured life.