ACADEMIC REGULATIONS (R – 14)

COURSE STRUCTURE

AND

DETAILED SYLLABI

FOR

B. Tech Regular Four Year Degree Courses
(For the Batches Admitted From 2014-2015)

&

B. Tech (Lateral Entry Scheme)
(For the Batches Admitted From 2015-2016)

COMPUTER SCIENCE & ENGINEERING

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)
(Affiliated to JNTUA, Ananthapuramu, Approved by AICTE, New Delhi, Accredited by NAAC, Bengaluru)
R.V.S. NAGAR, CHITTOOR- 517 127 (AP)
The autonomy is conferred on Sri Venkateswara College of Engineering and technology by JNT University, Anantapur based on its performance as well as future commitment and competency to impart quality education. It is a mark of its ability to function independently in accordance with the set norms of the monitoring bodies like UGC and AICTE. It reflects the confidence of the affiliating University in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awards degrees on behalf of the college. Thus, an autonomous institution is given the freedom to have its own curriculum, examination system and monitoring mechanism, independent of the affiliating University but under its observance.

Sri Venkateswara College of Engineering and Technology is proud to win the confidence of all the above bodies monitoring the quality in education and has gladly accepted the responsibility of sustaining, the standards and ethics for which it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education. As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTUA, Anantapur to frame the regulations, course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several expertise solicited from academics, industry and research, to produce quality engineering graduates to the society.

All the faculty, parents and students are requested to go through all the rules and regulations carefully. Any clarifications needed are to be sought at appropriate time and with principal of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments. The cooperation of all the stake holders is sought for the successful implementation of the autonomous system in the larger interests of the college and brighter prospects of engineering graduates.

Principal
VISION

Carving the youth as dynamic, competent, valued and knowledgeable professionals who shall lead the Nation to a better future.

MISSION

✓ Providing Quality Education, student-centered teaching-learning processes and state-of-art infrastructure for professional aspirants hailing from both rural and urban areas.

✓ Imparting technical education that encourages independent thinking, develops strong domain of knowledge, hones contemporary skills and positive attitudes towards holistic growth of young minds.

✓ Evolving the Institution into a Center of Academic and Research Excellence.

QUALITY POLICY

Sri Venkateswara College of Engineering and Technology strides towards excellence by adopting a system of quality policies and processes with continued improvements to enhance students’ skills and talent for their exemplary contribution to the society, the nation and the world.
1. **Applicability**: All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic year 2014-2015 onwards. Any reference to “College” in these rules and regulations stands for Sri Venkateswara College of Engineering and Technology (Autonomous).

2. **Extent**: All the rules and regulations, specified herein after shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, Principal, Sri Venkateswara College of Engineering and Technology (A) shall be the Chairman of the Academic Council.

3. **Admission**:

   3.1 **Admission in to first year of Four Year B.Tech., Degree Program of study in Engineering**:

   3.1.1 **Eligibility**: A candidate seeking admission into the first year of four year B.Tech., Degree Program should have Passed either Intermediate Public Examination conducted by the Board of Intermediate Education, Government of Andhra Pradesh with Mathematics, Physics and Chemistry as optional subjects (or any equivalent examination recognized by the Board of Intermediate Education and JNTU Anantapur) or Diploma in Engineering in the relevant branch conducted by the Board of Technical Education, Andhra Pradesh (or equivalent Diploma recognized by State Board of Technical Education, Government of Andhra Pradesh and JNTU Anantapur) for admission.
3.1.2 Admission Procedure: As per the existing stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made into the first year of four year B.Tech., Degree Program as follows:

Seats under various categories are filled as per the norms prescribed by the Government of Andhra Pradesh.

3.2 Admission into the second year of four Year B.Tech., Degree Program in Engineering:
3.2.1 Eligibility: Candidates qualified in ECET (FDH) and/or admitted by the Convener, ECET (FDH).

In all such cases for admission, when needed, Permissions from the statutory bodies are to be obtained.

3.2.2 Admission Procedure: Lateral Entry seats are filled as per the norms prescribed by the Government of Andhra Pradesh from time to time.

4. Programs of study offered leading to the award of B.Tech degree
1. B.Tech (Civil Engineering)
2. B.Tech (Electrical & Electronics Engineering)
3. B.Tech (Mechanical Engineering)
4. B.Tech (Electronics & Communication Engineering)
5. B.Tech (Computer Science & Engineering)
6. B.Tech (Information Technology)
7. B.Tech (Automobile Engineering)

5. Academic Year: The College shall follow semester pattern from first year onwards. I, II semesters of First Year of four Year B.Tech., Program shall have a minimum of 14 instructional weeks. From second year onwards each semester shall have a minimum of 16 instructional weeks.

6. Course Structure: Each Program of study shall consist of:
   - General subjects comprise of the following courses: (5 to 10%)
     i. English Language / Communication Skills / Mind Skills
     ii. Humanities and Social Sciences
     iii. Principles of Management

The above courses are common to all Branches.
• **Basic science subjects comprise of the following courses: (15 to 25%)**
  
  i. Mathematics  
  ii. Physics  
  iii. Chemistry  

The above courses are common to all branches.

• **Basic Engineering subjects comprise some of the following courses, depending upon the branch: (15 to 25%)**
  
  i. Engineering Drawing  
  ii. Engineering workshop  
  iii. Engineering Mechanics  
  iv. Basic Mechanical Engineering  
  v. Basic Electrical & Electronics Engineering  
  vi. Computer Programming  

• **Core Subjects: (45 to 55%)**

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

• **Elective subjects: (10 to 15%)**

Electives will be offered to the students to diversify the spectrum of knowledge.

These electives can also be chosen based on the interest of the student to broaden his individual skill and knowledge in the specialized area.

**Main Project:** Main Project shall be carried out in the institution / industry during IV year II semester for a period of one semester. The project report shall be submitted to the department after successful completion.

7. **Credit System** : Credits are assigned based on the following norms.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Semester Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours / Week</td>
</tr>
<tr>
<td>Theory</td>
<td>01</td>
</tr>
<tr>
<td>Practical</td>
<td>03</td>
</tr>
<tr>
<td>Drawing Practice</td>
<td>02</td>
</tr>
<tr>
<td>Project Work</td>
<td>--</td>
</tr>
</tbody>
</table>
i. As a norm, for the theory subjects, **one credit** for one contact period per week is assigned.

ii. As a norm, for practical courses **two credits** will be assigned for three contact periods per week.

iii. Tutorials do not carry any credits. However, each of the analytical and problem oriented courses will have one tutorial period per week.

iv. For Project work where formal contact hours are not specified, credits are assigned based on the complexity of the work to be carried out.

- The four year curriculum of any B.Tech, Program of study shall have a total of **176 credits**.
- In the case of lateral entry students, B.Tech. program of study shall have a total of **132 credits**.
- The exact requirements of credits for each subject will be as recommended by the concerned Board of Studies and approved by the Academic Council.

**8. Examination System** : All components in any Program of study will be Evaluated continuously through internal evaluation and an external evaluation component conducted as semester-end examination.
### 8.1 Distribution of Marks:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Examination</th>
<th>Marks</th>
<th>Examination and Evaluation</th>
<th>Scheme of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>70</td>
<td>Semester-end examination (external Paper setting and external evaluation)</td>
<td>This Examination question paper in theory subjects will be for a maximum of 70 marks. The question paper shall consists of two parts <strong>Part A</strong>: 5 short answer questions shall be given for a maximum 20 marks with one question from each unit. No choice will be given and all questions carry equal marks. <strong>Part B</strong>: 5 Descriptive/problematic questions shall be given for a maximum of 50 marks with one question from each unit with internal choice i.e either or type. All questions carry equal marks.</td>
</tr>
<tr>
<td>1</td>
<td>Theory</td>
<td>30</td>
<td>Mid- Examination of 120 Min. duration (Internal evaluation). The question paper shall be of descriptive type with 5 questions out of which 4 are to be answered and evaluated for 20 marks.</td>
<td>Two (02) mid-term exams, each for 20 marks are to be conducted. Better of the two shall be considered for awarding internal marks. <strong>Mid-I</strong>: After first spell of instructions (First 2 Units) <strong>Mid-II</strong>: After second spell of instructions (Last 3 Units.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>Assignment (Internal evaluation)</td>
<td>Two assignments shall be given and each will be evaluated for 10 marks. Average of two Assignments shall be taken as internal marks for the</td>
</tr>
<tr>
<td>Assignment</td>
<td>Description</td>
<td>Marks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assignment-I</td>
<td>After first spell of instructions (First 2 Units)</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assignment-II</td>
<td>After second spell of instructions (Last 3 Units.)</td>
<td>70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Semester-End Laboratory Examination (External evaluation) | 70 marks are allotted for laboratory examination during semester-end.                                                                 | 70    |
| Continuous evaluation | Performance in laboratory experiments and Record are considered.                                                                                                                                         | 20    |
| Internal test | Practical Test at the end of the semester.                                                                                                                                                      | 10    |

Marks scored in the continuous evaluation and internal test are considered for awarding internal marks.

| Semester-End Drawing Examination (External evaluation) | 70 marks are allotted for drawing examination during semester-end.                                                                 | 70    |
| Continuous evaluation | Performance in Drawing classes will be considered.                                                                                                                                              | 20    |
| Internal test | Two tests will be conducted. Better of the two will be taken.                                                                                                                                  | 10    |

Marks scored in the continuous evaluation and internal test are considered for awarding internal marks.

| Semester-End Project Viva-Voce Examination by a Committee as detailed under 8.2. | 300 marks are allotted for project work.                                                                                                               | 300   |
| Continuous evaluation | Semester-end Project Viva-Voce Examination by a Committee as detailed under 8.2.                                                                                           | 200   |
| Internal evaluation | Continuous evaluation by the Departmental Committee.                                                                                                                                       | 100   |
Wherever the Question paper is different from the conventional pattern, the concerned pattern of question paper will be given at the end of the syllabus of that subject.

8.2 Project Work Evaluation

The Semester-End Examination (Viva-voce) shall be conducted by a Committee consisting of External examiner (nominated by the Chief Controller of Examinations), HOD, & Supervisor. The evaluation of project work shall be conducted at the end of the IV year second semester. The Internal Evaluation shall be made by the Departmental Committee, on the basis of two project reviews of each student.

8.3 Eligibility to appear for the Semester-End examination:

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

8.3.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted on medical grounds by the College Academic Committee. A stipulated fee shall be payable towards condonation of shortage of attendance to the College.

8.3.3 Shortage of Attendance below 65% in aggregate shall in no case be condoned and the candidate will be detained.

8.3.4 Detained students are not eligible to take their end examination of that class and their registration shall stand cancelled.

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

8.4 Evaluation: Following procedure governs the evaluation.

8.4.1 The marks for the internal evaluation components will be added to the external evaluation marks secured in the Semester –End examinations, to arrive at total marks for any subject in that semester.

8.4.2 Performance in all the subjects is tabulated program-wise and will be scrutinized by the Results Committee and subject-wise marks lists are finalized. Total marks obtained in each subject are converted into letter grades. Results Committee comprises of Principal, Controller of Examinations, one Senior Professor nominated by the Principal and the University Nominee.

8.4.3 Student-wise tabulation is done and student-wise Grade Sheet is generated and issued to the students.

8.5 Revaluation / Recounting:

Students shall be permitted for request for recounting/revaluation of the Semester-End
examination answer scripts within a stipulated period after payment of prescribed fee. After recounting or revaluation, records are updated with changes if any and the student will be issued a revised grade sheet. If there are no changes, the same will be intimated to the students.

8.6 Supplementary Examination:

8.6.1 In addition to the regular Semester-End examinations conducted, the College may also schedule and conduct supplementary examinations for all the subjects of other semesters when feasible for the benefit of students. Such of the candidates writing supplementary examinations may have to write more than one examination per day.

9. Academic Requirements for Promotion/completion of regular B.Tech Program of study:

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

9.1 For students admitted in B.Tech (Regular) Program:

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design drawing subject or project, if he secures not less than 35% of marks in the Semester End examination and a minimum of 40% of marks in the sum total of the internal evaluation and Semester-End examination taken together.

ii. A student shall be promoted from second year to third year only if he fulfills the academic requirement of securing 44 credits from:
   a) Two regular and two supplementary examinations of I-year I semester.
   b) Two regular and one supplementary examinations of I-year II semester.
   c) One regular and one supplementary examination of second year I semester.
   d) One regular examination of II-year II Semester.

Irrespective of whether the candidates appear for Semester-End examination or not as per the normal course of study.

iii. A student shall be promoted from third year to fourth year Program of study only if he fulfills the academic requirements of securing 66 credits from:
   a) Three regular and three supplementary examinations of I-year I semester.
   b) Three regular and two supplementary examinations of I-year II Semester
   c) Two regular and two supplementary examination of second year I semester.
   d) Two regular and one supplementary examinations second year II semester.
   e) One regular and one supplementary examination of third year I semester.
   f) One Regular Examination of Third year II semester.
Irrespective of whether the candidate appears for the Semester-End examination or not as per the normal course of study and in case of getting detained for want of credits by sections 9.1(ii) and 9.1 (iii) above, the student may make up the credits through supplementary examinations before the date of commencement of class work for III year I semester or IV year I semester as the case may be.

iv. A student shall register for all the 176 credits and earn all the 176 credits. Marks obtained in all the 176 credits shall be considered for the award of the class based on CGPA.

v. A student who fails to earn 176 credits as indicated in the course structure within eight academic years from the year of his admission shall forfeit his seat in B. Tech., Program and his admission stands cancelled.

9.2 For Lateral Entry Students (batches admitted from 2015-2016):

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project if he secures not less than 35% of marks in the Semester-End examination and a minimum of 40% of marks in the sum total of the internal evaluation and Semester-End examination taken together.

ii. A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of securing 44 credits from the following examinations.
   a) Two regular and two supplementary examinations of II year I semester.
   b) Two regular and one supplementary examination of II year II semester.
   c) One regular and one supplementary examination of III year I semester.
   d) One Regular Examination of Third year II semester.

Irrespective of whether the candidate appear the Semester-End examination or not as per the normal Course of study and in case of getting detained for want of credits the student may make up the credits through supplementary exams of the above exams before the date of commencement of class work for IV year I semester.

i. A student shall register for all 132 credits and earn all the 132 credits. Marks obtained in all 132 credits shall be considered for the award of the class based on CGPA.

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

9.3 Audit Courses: Any student who wishes to pursue audit course can register for the same with the concerned teacher and attend to the classes regularly. No examination will be conducted, no grade will be given for the audit courses. However such of those students who have registered and got the requisite attendance of 75% in the audit course, it will be mentioned in their grade sheet.

10. Transitory Regulations:
Students who got detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered and they continue to be in the academic regulations of the batch they join later.
A regular student has to satisfy all the eligibility requirements within the maximum stipulated period of eight years, and a lateral entry student within six years, for the award of B.Tech Degree.

11. Grades, Grade Point Average and Cumulative Grade Point Average
11.1 Grade System: After all the components and sub-components of any subject (including laboratory subjects) are evaluated, the final total marks obtained will be converted to letter grades on a “10 point scale” described below.

<table>
<thead>
<tr>
<th>% of marks obtained</th>
<th>Grade</th>
<th>Grade Points(GP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 to 100</td>
<td>A+</td>
<td>10</td>
</tr>
<tr>
<td>80 to 89</td>
<td>A</td>
<td>9</td>
</tr>
<tr>
<td>70 to 79</td>
<td>B</td>
<td>8</td>
</tr>
<tr>
<td>60 to 69</td>
<td>C</td>
<td>7</td>
</tr>
<tr>
<td>50 to 59</td>
<td>D</td>
<td>6</td>
</tr>
<tr>
<td>40 to 49</td>
<td>E</td>
<td>5</td>
</tr>
<tr>
<td>Less than 40 in sum of Internal &amp; External (or) Less than 35 in External</td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td>Not Appeared</td>
<td>N</td>
<td>0</td>
</tr>
</tbody>
</table>

➢ Pass Marks: A student is declared to have passed theory and/or laboratory subject, if he secures minimum of 35% marks in external examination, and a minimum of 40% marks in the sum total of internal evaluation and external examination taken together. Otherwise he will be awarded fail grade – F in such subject irrespective of
internal marks.

- F is considered as a fail grade indicating that the student has to pass the semester-end examination in that subject in future and obtain a grade other than F and N for clearing this subject.

11.2 **Grade Point Average (GPA):**

Grade Point Average (GPA) will be calculated as given below on a “10 Point scale” as an Index of the student’s performance at the end of each semester:

\[
GPA = \frac{\sum(C \times GP)}{\sum C}
\]

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

11.3 **Cumulative Grade Point Average (CGPA):**

At the end of every semester, a Cumulative Grade Point Average (CGPA) on a 10 Point scale is computed considering all the subjects passed up to that point as an index of overall Performance up to that Point as given below:

\[
CGPA = \frac{\sum(C \times GP)}{\sum C}
\]

Where C denotes the credits assigned to subjects undertaken up to the end of the current year/semester and GP denotes the grade points earned by the student in the respective courses.

11.4 **Grade Sheet:** A grade sheet (Marks Memorandum) will be issued to each student indicating his performance in all subjects registered in that semester indicating the GPA and CGPA. GPA and CGPA will be rounded off to the second place of decimal.

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

13. **Award of Degree:** The Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Ananthapuramu on the recommendation of the Principal of SVCET (Autonomous), Chittoor.

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

- Registered and successfully completed all the components prescribed in the program of study for which he is admitted.
- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of study within the stipulated time.
- Obtained CGPA greater than or equal to 5.0 (Minimum requirement for declaring as passed.)

13.2 Award of Class: Declaration of Class is based on CGPA.

<table>
<thead>
<tr>
<th>Cumulative Grade Point Average</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥7.0</td>
<td>First Class with Distinction</td>
</tr>
<tr>
<td>≥6.0 and &lt;7.0</td>
<td>First Class</td>
</tr>
<tr>
<td>&gt;5.0 and &lt;6.0</td>
<td>Second Class</td>
</tr>
<tr>
<td>5.0</td>
<td>Pass Class</td>
</tr>
</tbody>
</table>

14. With – Holding of Results: If the candidate has not paid dues to the university/college or if any case of in-discipline is pending against him, the result of the candidate shall be withheld and he will not be allowed / promoted into the next higher semester. The issue of degree is liable to be withheld in such cases.

15. Additional academic regulations:
   i. A regular student has to complete all the eligibility requirements within the maximum stipulated period of eight years, and a lateral entry student within six years.
   ii. A student can appear for any number of supplementary examinations till he clears all subjects within the stipulated period.
   iii. A grade sheet (marks memorandum) will be issued to the student indicating his performance in all the courses of that semester along with the GPA and CGPA.
   iv. Any canvassing / impressing the administration, examiners, faculty or staff in any form, the candidate is liable for punishment as per the mal practice rules appended here with.
   v. When a student is absent for any examination (internal or external) he is treated as to have appeared and obtained zero marks in that component (course) and grading is done accordingly.
   vi. When a component is cancelled as a penalty, he is awarded zero marks in that component.
16. **Amendments to regulations:**
The Academic Council of Sri Venkateswara College of Engineering and Technology (Autonomous) reserves the right to revise, amend, or change the Regulations, Scheme of Examinations, and / or Syllabi or any other Policy relevant to the needs of the society or industrial requirements etc., without prior notice.

17. **General:**
Where the words “he”, “him”, “his”, “himself” occur in the regulations, they include “she”, “her”, “herself”.

**Note:** Failure to read and understand the regulations is not an excuse.
<table>
<thead>
<tr>
<th>Nature of Malpractices / Improper conduct</th>
<th>Punishment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>If the candidate</strong></td>
<td></td>
</tr>
<tr>
<td>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)</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject only.</td>
</tr>
<tr>
<td>(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.</td>
<td>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.</td>
</tr>
<tr>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>3. Comes in a drunken condition to the examination hall</td>
<td>Expulsion from the examination hall</td>
</tr>
<tr>
<td></td>
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<tr>
<td>---</td>
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</tr>
<tr>
<td>examination hall.</td>
<td>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.</td>
</tr>
<tr>
<td>4.</td>
<td>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.</td>
</tr>
<tr>
<td>5.</td>
<td>Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.</td>
</tr>
<tr>
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</tr>
<tr>
<td>6.</td>
<td>Possess any lethal weapon or firearm in the examination hall.</td>
</tr>
<tr>
<td>7.</td>
<td>Impersonates any other candidate in connection with the examination.</td>
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</tr>
<tr>
<td><strong>8.</strong></td>
<td>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-in-charge, 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 or 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.</td>
</tr>
<tr>
<td><strong>9.</strong></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
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<td>---</td>
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</tr>
<tr>
<td>11.</td>
<td>Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.</td>
</tr>
<tr>
<td>12.</td>
<td>If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Examination committee for further action to award suitable punishment.</td>
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Malpractices identified by squad or special invigilators

1. Punishments to the candidates as per the above guidelines.
# SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)
## R.V.S. NAGAR, CHITTOOR, ANDHRA PRADESH-517127.
## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### SCHEME OF INSTRUCTION AND EXAMINATIONS UNDER R14 REGULATIONS EFFECTIVE FROM 2014-15

#### I B.Tech- I Semester

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Objectives:
The objectives of this course are to
1. model a wide range of engineering and practical problems as ordinary differential equations.
2. apply fundamental mathematical principles as well as computational techniques to the problems of engineering and scientific practice.
3. formulate the engineering problems in vectorial form.

Outcomes:
After completion of the course the student will be able to
1. comprehend the areas of application of differential equations.
2. apply the principles of differential equations, functions of variables separable, integration, Laplace transforms and vector calculus to the engineering and scientific problems.
3. obtain their solutions using various computational methods.

UNIT-I
DIFFERENTIAL EQUATIONS: Linear and Bernoulli’s Equations - Non-homogenous Linear Differential equation of second and higher order with constant co-efficients. Newton’s law of cooling- L-R-C circuits.

UNIT-II

UNIT-III

UNIT-IV

UNIT-V
VECTOR CALCULUS: Gradient, Divergence, Curl and their properties (without identities). Vector Integration: Line Integrals – Potential functions - Area, Surface and Volume integrals -
Green’s theorem- Stoke’s theorem & Gauss Divergence theorems (without proof) – problems on Green’s, Stoke’s and Gauss’s Theorem

**Text Books:**

**References:**
Objectives:

1. To introduce basic physics concepts relevant to different branches of Engineering and Technology
2. To prepare graduates in understanding the basic principles of Modern Optics, Solid State Physics and their possible applications.
3. They shall also understand the role of the physics in the development of newer innovations and technologies

Outcomes

1. Graduates will able to apply the knowledge of Physics in the field of Communications, Electrodynamics, Solid State Physics and Optics.
2. The acquaintance of basic physics principles would help the engineers to develop or understand the working of different tools and devices
3. It equips the students with the fundamental knowledge of physics together with the problem solving skills and understanding.

UNIT I


MODERN OPTICS


UNIT II

CRYSTAL STRUCTURES AND X-RAY DIFFRACTION: Introduction – Space lattice – Basis – Unit cell – Lattice parameter – Crystal systems – Bravais lattices – Structure and packing fractions of Simple cubic, body centered cubic, face centered cubic crystals-Directions and planes in crystals – Miller Indices – Separation between successive \([ h k l ]\) planes – Bragg’s law-X-Ray Diffraction by Powder method

ULTRASONICS Introduction – Production of ultrasonics by piezoelectric method – Properties and detection of Ultrasonic waves – Applications in non-destructive testing.
UNIT III
PRINCIPLES OF QUANTUM MECHANICS: Wave and particles – de Broglie hypotheses – Matter waves – Schrödinger time independent wave equation – Physical significance of wave function – Particle in one dimensional box

FREE ELECTRON THEORY: Classical free electron theory – Equation for electrical conductivity - Quantum free electron theory – Fermi-Dirac distribution –Kronig-Penny model (qualitative)

UNIT IV

MAGNETIC PROPERTIES

UNIT V

SUPERCONDUCTORS: General properties of superconductors – Meissner effect – Penetration depth – Type I and Type II superconductors – Flux quantization – Josephson effect – Application of superconductors.


Text Books:
2. Gaur and Gupta:Engineering Physics, New Delhi, DhanpatRai Publishers, 2010

Reference Books:
Objectives:
1. To study about conservation of natural resources, environmental monitoring & remediation, Industrial waste management and public health.
2. To develop analytical skills, critical thinking & demonstrate problem solving skills using scientific and engineering techniques.
3. To motivate the students to participate in environment protection and make man free from all sorts of environmental problems.

Outcomes:
After completion of the course the student will be able to
1. develop critical thinking (or) observation skills and apply them in the analysis of a problem (or) question related to the environment.
2. analyse and interpret the complex relationships between natural and human systems.
3. analyse and interpret the fundamental physical, chemical and biological principles that govern natural process.

UNIT-I
ENVIRONMENT AND NATURAL RESOURCE MANAGEMENT: Definition, Scope and Importance of Environmental Science, Need for Public Awareness, Components of Environment (Atmosphere, Hydrosphere, Lithosphere and Biosphere) Renewable and non-renewable Natural resources and associated problems:
Forest resources: Use and over-exploitation, deforestation, case studies – Timber extraction, Mining, Dams and other effects on forest and tribal people. Water resources: Use and over utilization of surface and ground water, Floods, Drought, conflicts over water, dams-benefits and problems. Food resources: Sources of food, impacts of overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: Renewable and Non-renewable energy resources

UNIT-II
TYPES OF ECOSYSTEMS:
a. Forest ecosystem  b. Grassland ecosystem c. Desert ecosystem
d. Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT-III
BIODIVERSITY AND ITS CONSERVATION: Introduction, Definition, Types of biodiversity (genetic, species and ecosystem diversity)- Bio-geographical classification of India, Values of biodiversity(Consumptive use, Productive use, Social use, Ethical use, Aesthetic and Option values)- India as a mega diversity nation-Hot spots of India-Threats to biodiversity(habitat loss, Poaching of wildlife, man-wildlife conflicts)-Endangered and endemic species of India-Conservation of biodiversity(In-situ and Ex-situ conservation of biodiversity).
UNIT-IV
ENVIRONMENTAL POLLUTION AND ACT’S: Definition, causes, effects and control measures of:
Solid Waste Management: Causes, effects and control measures of urban and industrial wastes.
ACT’S: Environment Protection Act-Air (Prevention and Control of Pollution) Act-Water (Prevention and control of Pollution) Act-Wildlife Protection Act-Forest Conservation Act-
Disaster management: Floods, Earthquake, Cyclone and Landslides.

UNIT-V
Field Work: Visit to local polluted site-Urban/Industrial.

Text Books:
  1. ErachBharucha, Textbook of Environmental Studies for Undergraduate courses by from UGC.

References:
SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I  B.Tech I Semester

Code:14AEE03

BASIC ELECTRICAL ENGINEERING
(Common to CSE & IT)

Objectives:

1. To understand the Basic Fundamentals in Electrical Circuits.
2. To study the construction, Principle of operation and performance of DC and AC Machines
3. To understand the Principle of Measuring Instruments.

Outcomes:

After completion of this course the students will be able to:
1. Understand the fundamentals of Electrical Circuits
2. Acquire the concept of all types of Electrical Machines like DC and AC Machines
3. Know the principle of Measuring Instruments

UNIT I

INTRODUCTION TO ELECTRIC CIRCUITS: Circuit element – Sources - Ohm’s Law - Kirchhoff’s Law - Network reduction Techniques, Mesh and Nodal Analysis. Sinusoidal Alternating Quantities – Concept of Frequency, Period, Phase, Average and RMS Values – Concept of Impedance- Simple Problems.

UNIT II

NETWORK THEOREMS: Thevenin’s, Norton’s, Superposition and Maximum Power Transfer Theorem - Simple Problems with DC & AC excitation.

UNIT III


UNIT IV


UNIT V


TEXT BOOKS:


REFERENCE BOOKS:

Objectives:

The course presents basics of C programming including Data representation, Control Structures, Functions, Arrays, Pointers, Strings, and Files that enables the students to:

1. Understand the basic components of computing environment.
2. Design and develop algorithms and flowcharts for solving a problem.
3. Be familiar with the importance of control flow statements in programming.
4. Know structured programming approach to solve real time applications.

Outcomes:

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

1. Apply the principles of structured programming in problem solving.
2. List out the salient features and applications of C programming language.
3. Demonstrate the techniques for implementing applications using C programming.
4. Develop C programming skills to do variety of tasks like low level programming, networking, and OS related operations and so on.

UNIT – I

Introduction to Computers, Computer Problem Solving and C Language


Introduction to C Language: The C Character Set, Identifiers and Keywords, Data Types, Variables and Constants, Structure of a C program, Input and Output, Programming examples.

UNIT – II

Fundamental Algorithms, Selection and Making Decision and Iterative Statements

Fundamental Algorithms: Exchanging the values between two variables, Counting, Summation of a set of numbers, Factorial computation, Sine function computation, Generation of the Fibonacci sequence, Reversing the digits of an integer, Basic conversion, Character to Number Conversion.

Selection and Making Decision: Logical data, Operator – Types of operators, Expression - Precedence and Associativity, Evaluation of Expressions, Type Conversion, Conditional and Unconditional Statements.

Iterative Statements: Concept of a loop – Pretest and Posttest loops, Event and Counter Controller loops, Looping application.

UNIT – III

Factoring Methods, Functions, Arrays and Array Techniques

Factoring Methods: Finding square root of a number, The smallest divisor of an Integer, The GCD of two integers, Generating prime numbers, Computing prime factor of an Integer, Generation of Pseudo random number, Raising the number to large power, Computing the n\textsuperscript{th} Fibonacci.
Functions: Definition, Accessing a function, Inter function communication by Call-by-value, Call-by-reference (address), Standard library functions, Scope.

Arrays: Introduction, Two-Dimensional arrays, Multi-Dimensional arrays, Inter function communication with array elements, Array applications.

Array Techniques: Array order reversal, Array counting, Finding the maximum number set, Removal duplicates from an ordered array, Partitioning an array, Finding $k^{th}$smallest element, Longest Monotone Subsequence.

UNIT – IV

Enumerated, Structure and Union Types, Strings
Enumerated, Structure and Union Types: The Type definition (typedef), Enumerated Types (enum), Definition and Declaration of Structures, Accessing Structures and Nested Structures, Arrays of Structures, Structures and functions, Union, Programming applications.

Strings: Basics, String input / output function, Arrays of Strings, String manipulation functions, String / Data conversion.

UNIT – V

Pointers, Pointer Applications and Files
Pointers: Introduction, Pointer arithmetic and Arrays, Pointers to Pointers, Pointers for Inter function communications, Compatibility, Lvalue and Rvalue.

Pointer Applications: Dynamic Memory Allocation, Passing an array to a function, Passing structures through pointers, Pointers and functions, Pointers and strings.

Files: Why files, Text and Binary files, Basic operations on files, Standard library functions for files, Converting file type and Command-line parameters.

TEXT BOOKS


REFERENCES

Objectives:
1. To educate students about the basics of instrumentation, measurement, interpretation, and analysis.
2. To promote equipment/machinery handling skills and also to train the students with proper laboratory discipline.
3. To teach the behaviour of magnetic, semiconductor and optical materials/instruments and explain its properties and applications.

Outcomes:
1. They shall able to obtain and analyze scientific data from different physics laboratory instruments.
2. They shall develop their manipulative, observational and reporting skills.
3. The student will be able to understand many modern devices and technologies based on optics, electrodynamics, semiconductors, lasers and optical fibers.

ENGINEERING PHYSICS LAB:
A minimum of 10 experiments to be conducted during the academic year

1. Determine the wavelengths of given light source - Spectrometer.
2. Dispersive power of prism
4. Determine the particle size by using laser source
5. Determine the thickness of thin wire by Interference.
6. Determine the radius of curvature of given plano convex lens by forming Newton Rings.
7. Magnetic field along the axis of a current carrying coil – Stewart and Gee’s method.
10. Determine the wavelength of Laser source by using optical fiber.
11. Determination of Hall Coefficient and Carrier concentration in the given Semiconductor.
12. Determine the energy loss of ferromagnetic sample by plotting B-H curve
14. Determine the Dielectric constant of Barium Titanate.
Objectives:
1. To understand the basic work shop tools and operations such as carpentry, fitting & sheet metal trades.
2. To understand the basic work tools of house wiring & house wiring connections etc.
3. To understand the basic joints and manufacturing processes such as foundry and welding.

Outcomes:
After completion of the study of this lab a student will be able to:
1. Distinguish between tools of various trades such as carpentry, fitting, sheet metal, welding, foundry & house wiring.
2. Explain the tools & connections pertaining to house wiring, stair case wiring etc.
3. To describe the use of carpentry & fitting joints such as lap, dovetail, mortise, tenon joint, various sheet metal models & manufacturing processes.

1. TRADES FOR EXERCISES:
a. Carpentry shop– Two joints (exercises) involving tenon and mortising, groove and tongue: Making T lap joint, cross lap joint, Dovetail lap Joint, mortise and tenon joint, T - Bridle joint from out of 300 x 40 x 25 mm soft wood stock
b. Fitting shop– Two joints (exercises) from: square joint, V joint, half round joint and dovetail joint out of 100 x 50 x 5 mm M.S. stock
c. Sheet metal shop– Two jobs (exercises) from: Tray, cylinder, hopper and funnel from out of 22 or 20 guage G.I. sheet
d. House-wiring– Two jobs (exercises) from: wiring for two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp, wiring for Tube Light and wiring for a water pump with single phase starter.
e. Foundry– Preparation of two moulds (exercises): for a single Piece pattern and a Two Piece pattern.

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

REFERENCE BOOKS:
Objectives:
The main objective of conducting this lab is to enable the students to:

1. Know C programming development environment, compiling, debugging, linking and executing a program using the development environment.
2. Apply the syntaxes of control statements and loop structures.
3. Analyze the complexity of problems, modularize the problems into small modules and then convert them into programs.
4. Learn about pointers, memory allocation techniques and use of files for dealing with variety of problems.

Outcomes:
After performing this lab, the students should be able to:

1. Get practical knowledge about how to use concepts of C and Data structures for solving a problem.
2. Acquire and apply knowledge on pointers, memory allocation and files for dealing with variety of real world problems.
3. Compete the industry professional in analyzing and documenting a structured program by applying the coding standards.
4. Understand and apply the in-built functions and customized functions for solving the problems.

Week 1
a) Write a C program to exchange the values between two variables with and without using temporary variable.
   b) Sum of the individual digits means adding all the digits of a number. Ex: 123, sum of digits is 1+2+3=6. Write a C program to find the sum of individual digits of a positive integer.
   c) Write a C program to generate all the factors of 4 and 7 between 1 and n and count their value, where n is a value supplied by the user.

Week 2
a) Write a C program to compute the factorial of a given number.
   b) Write a C program to compute the Sine function.

Week 3
a) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
   b) Write a C program to reverse the digits of a given integer.

Week 4
a) Write a C program to covert the given decimal number into its equivalent binary, octal and hexadecimal number.
   b) Write a C program to calculate the following: \[ \text{Sum}=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10! \].
   c) Write a C program, which takes two integer operands and one operator from the user,
performs the operation and then prints the result. (Consider the operators +, -, *, /, % and use Switch Statement).

**Week 5**

a) Write C program to display the result of a student by considering the standard grades.
b) Write a C Program to find both largest and smallest in the given list of integers.

**Week 6**

a) Write a C program to generate Pascal’s triangle.
b) Write a C program to construct a pyramid of numbers.

**Week 7**

a) Write a C program
i) To find the square root of a given integer.
   ii) To find the smallest divisor of an integer.
   iii) To raise the number to large power.
   iv) To generate the prime numbers from 1 to n, where n is the value supplied by the user.

**Week 8**

a) Write a C program
i) To compute the prime factor of an integer.
   ii) To generate the pseudo random number.
   iii) To find the GCD (greatest common divisor) of two given integers.
   iv) To compute the $n^{th}$ Fibonacci number.

**Week 9**

a) Write a C program to find both the largest and smallest number in a list of integers.
b) Write a C program that uses functions to perform the following:
   i) Addition of Two Matrices   ii) Multiplication of Two Matrices.

**Week 10**

a) Write a C program that uses functions to perform the following operations:
   i) Reading a complex number     ii) Writing a complex number
   iii) Addition of two complex numbers   iv) Multiplication of two complex numbers
   (Note: represent complex number using a structure.)
b) Write a C Program to find whether the given string is a palindrome or not.

**Week 11**

a) Write a C program that uses functions to perform the following operations:
i) To insert a sub-string in to a given main string from a given position.
ii) To delete n Characters from a given position in a given string.
b) Write a C program to count the lines, words and characters in a given text.
Week 12
a) Write a C program to display the contents of a file.
b) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file).

Week 13
a) Write a C program using command line arguments to search for word in file and replace it with the specific word.
b) Write a C program
   i) To write macro definition to test whether a character is lowercase or not.
   ii) To check whether a character is alphabet or not.
   iii) To obtain the largest of two numbers.
c) Write a C program to concatenate two strings using command line arguments.
Objectives:
1. To improve the language proficiency of the students in English with an emphasis on LSRW Skills.
2. To strengthen the students to study academic subjects through theoretical and practical components of the syllabus.
3. To comprehend the growing demand for English in the modern world.
4. To enumerate the aims of teaching English in India.

Outcomes:
1. The students will learn the language by observing the rules of grammar, vocabulary and composition that are necessary.
2. Students are made to appreciate the intelligent and innovative use of rules in order to be able to generate creative output in tune with the demands of industry and the corporate world.
3. After the course, the students will improve their power of comprehension and the ability to express themselves through listening, reading, speaking and writing.
4. The students will be able to distinguish between formal English and functional English.

UNIT-I EMERGING TECHNOLOGIES:
Solar Thermal Power-Cloud Computing

UNIT-II ENVIRONMENTAL CONSCIOUSNESS:
Climate Change- Green cover-Pollution

UNIT-III ENERGY:
Renewable and Non-Renewable sources-Alternative sources-Conservation-Nuclear Energy

UNIT-IV ENGINEERING ETHICS:
Challenger Disaster-Biotechnology-Genetic Engineering-Protection From Natural Calamities

UNIT-V TRAVEL AND TOURSIM:
Advantages and Disadvantages of Travel –Tourism - Atithi Devo Bhava-Tourism in India.

- The teacher shall cover the following components which are given as exercises in the prescribed text book while teaching each of the five units listed above.

REMEDIAL GRAMMAR:
1. Articles
2. Prepositions
3. Time & Tense
4. Sentence Construction-Strategies (avoiding Repetition and ambiguity)
5. Sentence Transformation (Degrees, Voice, Speech & synthesis)
6. Common Errors in English

VOCABULARY:
1. Roots-Prefixes-Suffixes(RPS Method)
2. Synonyms
3. Antonyms
4. Phrasal Verbs
5. Idioms
6. One-word substitutes
WRITING PRACTICE (COMPOSITION):
1. Paragraph-Writing (Descriptive, Narrative, Persuasive, Expository and Creative)
2. Summarizing
3. Note-Making and Note taking
4. Letter-Writing (Formal & Informal)
5. Report writing

Texts for classroom study:

Reference Books:
6. Meenakshi Raman Sangeetha Sharma, Technical communication , Oxford

Question Paper Pattern:
From the prescribed text book without leaving any lessons:
1. Three mark questions  $4 \times 3 = 12M$
2. Ten Mark questions $2 \times 10 = 20M$

Based on the Grammar exercises given in the prescribed Text Book.

3. Reading Comprehension – I  5M
4. Synonyms & Antonyms  5M
5. Prefixes & Suffixes  5M
6. Tense Forms  4M
7. Compound words  2M
8. Prepositions & Articles  2M
9. Idioms  2M
10. Jumbled Sentences  5M
11. Letter writing  8M

Total 70M
Objectives:
The objectives of this course are to
1. conceptualise the basics and applications of matrices, interpolation, partial differential equations and transforms.
2. model a wide range of engineering and practical problems into any of the above suitable forms.
3. apply fundamental mathematical principles as well as computational techniques to the problems of engineering and scientific practice.

Outcomes:
After completion of the course the student will be able to
1. comprehend the areas of application of matrices, interpolation, partial differential equations and transforms.
2. apply the principles of matrices, curve fitting, partial differential equations, transforms etc. to the engineering and scientific problems.
3. obtain their solutions using various computational methods.

UNIT-I
Eigen values and Eigen vectors - Cayley-Hamilton theorem - Linear Transformations - Orthogonal transformations -Diagonalization of a matrix. Quadratic forms- Reduction of Quadratic form to Canonical form and their nature.

UNIT-II
Curve Fitting: Fitting a straight line - Second degree curve- Exponential curve - Power curve by method of least squares.
Interpolation: Forward Differences - backward differences-Newton’s forward and backward differences formulae for interpolation - Lagrange’s interpolation formula - Inverse interpolation .

UNIT-III
UNIT-IV


UNIT-V

PARTIAL DIFFERENTIAL EQUATIONS: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions - Method of separation of variables - solution of one dimensional wave equation, heat equation and two - dimensional Laplace’s equation.


Text Books:


References:


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Objectives:

1. To study the effect of hard water and its treatment for various purposes, corrosion and control of metallic materials,
2. To study the engineering materials such as high polymers namely plastics, rubbers and their preparation, properties and applications along with lubricants, refractories & cement with its applications.
3. To study the calorific value of fuels, combustion of fuels, working of batteries, recharging of batteries, application of different fuel cells.

Outcomes:

After completion of the course students will be able to understand

1. the impact of hard water and its removal, formation of corrosion, effect of corrosion and designing of corrosion resistance articles.
2. selection of suitable engineering materials for specific applications.
3. selection of suitable fuels, calculation of air requirements for combustion of fuel, applications of different batteries and fuel cells.

UNIT – I: WATER TECHNOLOGY


UNIT – II: CHEMISTRY OF CORROSION


UNIT – III: MATERIALS CHEMISTRY

Organic (High Polymers & Lubricants)

Plastics: Thermosetting and thermoplastics – Engineering applications and properties of PE, PTFE, PVC, Nylon and Bakelite.


Lubricants: Definition – Function of Lubricants – Classification of Lubricants – Properties of Lubricants (Viscosity Index – Flash and Fire point – Cloud and Pour point – Aniline point – Neutralization number – Mechanical strength).

Inorganic (Refractories & Cement)

Refractories: Definition – Classification – Important properties of refractories (Refractoriness, RUL, Thermal stability, Porosity, Dimensional stability and Mechanical strength).
Cement: Definition – Composition – Classification of cements – Setting and Hardening of cement.

UNIT – IV: FUELS AND COMBUSTION
Combustion: Combustion products and calculation of air requirement (numerical problems) – Flue gas analysis by Orsat’s apparatus.

UNIT – V: ELECTROCHEMICAL CELLS

Text Books:

Reference Books:
Objectives:
To understand
1. The importance of Engineering Drawing and get enhanced imagination capacity.
2. The Use of Engineering Drawing instruments and improve free hand Lettering.
3. The principles of orthographic projections and Preparation of pictorial drawings.

Outcomes:
After completion of this course, the student will be able to:
1. Prepare pictorial drawings as per the standards.
2. Communicate his/her ideas effectively by using orthographic projections.
3. Prepare the development of surfaces of engineering objects.

Introduction
Drawing Instruments and their uses, BIS conventions, Lettering, Dimensioning and free hand practicing. Geometrical constructions – construction of polygons – drawing tangents – dividing a line into number of equal divisions.

UNIT-I
Principles of projection – both first and third angle – Projections of points – Projections of straight lines- lines inclined to both the principal planes, determination of true length and true inclinations.

UNIT-II
Projections of planes – inclined to both the principal planes.
Projection of regular solids – prisms, Pyramids, cylinders, tetrahedron and cones – axis inclined to one plane.

UNIT-III
Sections of solids such as prisms, pyramids, cylinders, tetrahedron and cones (solids in simple position) – True shape of the section.

UNIT-IV
Principles of isometric projection – isometric scale – isometric projection of planes and solids – conversion of orthographic views into isometric views and vice- versa.

UNIT-V
Development of surfaces of simple solids such as prisms, pyramids, cylinders, tetrahedron, cones and part solids.

**Text Books:**

**References:**

**FINAL EXAMINATION QUESTION PAPER PATTERN**

**(External Evaluation & Paper setting)**

**Paper Setting:**

1. Two questions to be set from each unit in either or choice (All Questions carries equal marks)
2. Student has to answer all questions.
Objectives:

The objective of this course is to make students to:

1. Know the difference between linear and non-linear data structures.
2. Introduce various techniques for representation and manipulation of the data in the real world.
3. Learn implementing various data structures Stacks, Queues, Linked Lists, Trees and Graphs.
4. Choose appropriate data structure, sorting and searching technique depending on the problem to be solved.

Learning Outcomes:

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

1. Understand different types of advanced abstract data types (ADT), Data structures and their implementation.
2. Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
3. Apply various techniques for representation and manipulation of the data in the real world.
4. Choose appropriate sorting and searching mechanism based on the problem being solved.

UNIT – I

Introduction
Introduction to Data Structures: Definition, Abstract Data Type, Classification of Data Structures- Linear and Non-Linear, Applications.

UNIT – II

Stacks and Queues
Stacks: Basic Operations, Array and Linked representations of stacks, Stack applications-Reversing Data, Infix to Postfix Transformation, Postfix expression evaluation, Other applications of Stacks.

Queues: Basic Operations, Array and Linked representations, Circular Queues, Priority Queue, Dequeue, Applications of Queues.

UNIT – III

Linear List

UNIT – IV

Searching and Sorting
Searching: Linear and Binary search methods.

Sorting: Bubble sort, Selection sort, Insertion sort, Quick sort, Merge Sort.
UNIT – V
Trees and Graphs
Graphs: Introduction, Graph Representation in C, Graph Storage Structures- Adjacency Matrix, Adjacency List, Graph Traversals, Applications.

TEXT BOOKS

REFERENCES
The Language Lab focuses on the production and practice of sounds of language and equips students with the use of English in everyday situations and contexts.

Objectives:

1. To train students to use language effectively in everyday conversations and to participate in group discussions to help them face interviews, and sharpen public speaking skills.
2. To expose the students to a varied blend of self-instructional, learner-friendly modes of language learning.
3. To enable them to learn better pronunciation following the principles of stress, intonation and rhythm.
4. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required ability to face computer-based competitive exams such as GRE, TOEFL, GMAT etc.

Outcomes:

1. The students will be able to recognize English sounds - Monophthongs, diphthongs and consonant sounds.
2. The students will appreciate and use correct pronunciation in English.
3. The pupils will distinguish between Received Pronunciation and Indian variety.
4. The lab course will make the students use English with correct stress and intonation patterns because English is a rhythmic language.

SYLLABUS:

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

UNIT-I  Organs of speech, speech mechanism, vowels, consonants, diphthongs, syllable division, word stress, intonation, phonetic transcription with support of speech solutions, dictionary practice with AHD & CALD software.

UNIT-II  Speaking of past, present & Future, Role play-Graded exercise with support of exercises from English Mastery, TOEFL Mastery & CALD Software.

UNIT-III  FUNCTIONAL ENGLISH-I

Situational conversation-Grader exercises with support of Rosetta Stone Software

UNIT-IV  FUNCTIONAL ENGLISH-II

Situational conversation-Grader exercises with support of Rosetta Stone Software
- Greeting/Self-introduction
- Expressing the cause of something
- Describe a current situation
- Speaking traditions/customs/public issues
- Making plans for vacation
- Expressing of emotions
- Shopping –bargaining price and making purchases
- Making an appointment
- Naming foods and describing tastes
- Reporting other person’s messages
- Requesting
- Asking for directions and describing
- Making suggestions, agreements and refusals
UNIT-V GROUP DISCUSSIONS:
Do’s and Don’ts of a G.D, Speaking on Knowledge based, controversial or abstract topics.

Reference Books:
1. English Language lab manual prepared by the Department of English
6. Krishna Mohan & NP Singh (Macmillan), Speaking English Effectively
ENGINEERING CHEMISTRY LAB  
(Common to EEE, ECE, CSE & IT)

Objectives:

To make the student understand the

1. Process of estimation of metal ions like Iron, Copper and Calcium by titrometry; Evaluation of impurities like dissolved oxygen, oxidizable substances in water,
2. Process of determination of acidity and alkalinity of water sample, determination of lubricant properties like viscosity Index, Flash and Fire points,
3. Construction of simple phase diagram, determination of acid strength by conductometry and potentiometry.

Outcomes:

After completion of practical's student will be able to

1. use volumetric analysis for the estimation of metal ions, hardness of water, dissolve oxygen in water, chlorides in water, oxygen demand for water, alkalinity and acidity of water,
2. the importance of viscosity index, flash point and fire point of lubricants,
3. evaluation of eutectic temperature of binary system, the use of conductometer and potentiometer.

Any TEN of the following experiments

1. Estimation of Hardness of water by EDTA method.
4. Determination of Chemical Oxygen Demand.
5. Determination of Acidity of Water sample.
7. Estimation of Copper by EDTA method.
8. Estimation of Ferrous Ion by Potassium Dichromate method.
10. Determination of viscosity of oils through Redwood viscometer No.1.
11. Determination of viscosity of oils through Redwood viscometer No.2.
12. Determination of Eutectic temperature of Binary system (Urea-Benzoic acid).
13. Acid- Base titration by Conductometric method.
14. Redox titrations by Potentiometry.
15. Titration of Strong acid vs Strong base by Potentiometry.

Text Books:

**Equipment Required:**

2. Analytical balance,
3. Reflux Condensers,
4. Pensky Marten’s apparatus,
5. Redwood viscometer,
6. Bomb calorimeter,
7. Conductometer, Potentiometer.
Objectives:
The main objective of conducting this lab is to enable the students to:

1. Get practical knowledge of data structures learned in the classroom.
2. Extend programming ability using a structured programming approach.
3. Build and manipulate linear and non-linear data structures, including stacks, queues, linked lists, trees, and graphs.
4. Choose the appropriate data structure to use in solving typical computer science problems.

Lab Outcomes:
After completing this lab, the student must demonstrate the knowledge and ability to:

1. Demonstrate the application of software engineering principles in design, coding, and testing of large programs.
2. Emphasize the specification of each data structure as an abstract data type before discussing implementations and application of the structure.
3. Aware of the importance of structured programming methods in developing the software.
4. Know the systematic approach to study algorithms, by focusing first on understanding the action of the algorithm then analyzing it.

Week 1
Write a C program that implements Stack operations using
a) Arrays  b) Pointers

Week 2
Write a C program that uses Stack operations to perform the following
a) Converting Infix expression to Postfix expression.
   b) Evaluating the Postfix expression.

Week 3
Write a C program that implements Queue operations using
a) Arrays  b) Pointers

Week 4
Write a C program that implements Circular Queue operations using Arrays.

Week 5
Write a C program that implements Dequeue operations using Arrays.

Week 6
Write a C program that uses functions to perform the following operations on singly linked list.
   i) Creation    ii) Insertion    iii) Deletion    iv) Traversal

Week 7
Write a C program that uses functions to perform the following operations on doubly linked list.
   i) Creation    ii) Insertion    iii) Deletion    iv) Traversal

Week 8
Write a C program that uses functions to perform the following operations on circular linked list.
   i) Creation  ii) Insertion  iii) Deletion  iv) Traversal

Week 9
Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers:
   i) Linear search  ii) Binary search

Week 10
Write a C program that implements the following sorting methods to sort a given list of integers in ascending order
   i) Bubble sort  ii) Selection sort  iii) Insertion sort

Week 11
Write a C program that implements the following sorting method to sort a given list of integers in ascending order:
   i) Merge sort  ii) Quick sort

Week 12
Write a C program that uses functions to perform the following Binary Tree Traversals
   a) Inorder  b) Preorder  c) Postorder

Week 13
Write a C program to implement the following graph traversals
   a) Depth-First Search  b) Breadth-First Search