**COURSE STRUCTURE AND DETAILED SYLLABI FORFOUR YEARS B. TECH UNDER ACADEMIC REGULATIONS R20**

**FOR**

**B. Tech Regular (Full-Time) Four Year Degree Courses**

(For the Batches Admitted from 2020-2021)

**&**

**B. Tech (Lateral Entry Scheme)**

(For the Batches Admitted From 2021-2022)

**INFORMATION TECHNOLOGY**

**SRI VENKATESWARA COLLEGE OF ENGINEERING ANDTECHNOLOGY (AUTONOMOUS)**

**Accredited by NBA, New Delhi & NAAC, Bengaluru Affiliated to JNTUA, Ananthapuram, Recognized by the UGCunder Section 12(B) and 12(F) | Approved by AICTE, New Delhi.**

**R.V.S. NAGAR, TIRUPATI ROAD, CHITTOOR – 517127 (A.P) –INDIA**

Website: www.svcetedu.org

**SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY**

**(Autonomous)**

**R.V.S. NAGAR CHITTOOR – 517 127**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

## Vision and Mission under regulation R 20

### Vision

To provide leading Technologies in Information Technology & Computer science fields to our graduates to be globally recognized as innovative computing professionals.

### Mission

M1. The Department of Information Technology is dedicated to produce Software Engineers with basic knowledge in math develop problem solving skills necessary for the career advancement in Computer Science / IT & allied disciplines, and practice.

M2. Produce engineers with a strong practical and theoretical exposure in the relevant disciplines, who are able to contribute to society through innovation enterprise and leadership.

M3. Nurture engineer with a global outlook and to provide technological leadership through necessary technical tools.

M4. Produce engineers with teamwork, communication and interpersonal skill.

### Programme Educational Objectives (PEOs):

**PEO 1 :** To educate and train students in professional career by acquiring knowledge in scientific, mathematics and computing and engineering principles.

**PEO 2 :** Apply analysis, design, optimization and implementation skills in order to formulate and solve Computer Science and Engineering and multidisciplinary problems.

**PEO 3 :** Use their skills in ethical & professional manner to raise the satisfaction level of stakeholders and to take up higher studies, research & development and other creative efforts in science & technology.

### Program specific outcome (PSOs):

**PSO1:** Analyze and recommend the appropriate IT infrastructure required implementation of a project

**PSO2:** design, develop and test software systems for world-wide network of computers to provide solutions to real world problems

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(Autonomous)**

**R.V.S. Nagar, CHITTOOR – 517 127, A.P**

**www.svcetedu.org E-mail : principal@svcetedu.org**

(**Affiliated to J.N.T. University Anantapur, Ananthapuramu).**

**ACADEMIC REGULATIONS (R20) for**

**B.Tech Regular (Full - Time) Four Year Degree Program**

**(For the batches admitted from the academic year 2020-21)**

**and**

**B.Tech. (Lateral Entry Scheme)**

**(For the batches admitted from the academic year 2021-22)**

**1. Applicability :** All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic year2020-2021 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 into first year of Four Year B.Tech., Degree Program of study in Engineering:**

**3.1.1 Eligibility**: A candidate seeking admission into the first year of four year B.Tech., Degree Program should have 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 JNTUA, Ananthapuramu) 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 JNTUA, Ananthapuramu) 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 ( Lateral Entry Scheme ) 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 and Electronics Engineering)
3. B.Tech (Mechanical Engineering)
4. B.Tech (Electronics and Communication Engineering)
5. B.Tech (Computer Science and Engineering)
6. B.Tech (Information Technology)
7. B.Tech (Computer Science and Engineering (Artificial Intelligence and Machine Learning))
8. B.Tech (Computer Science and Engineering (Data Science))

## 5. Choice Based Credit System:

The Indian Higher Education Institutions (HEI's) are changing from the conventional course structure to Choice Based Credit System (CBCS) along with introduction to semester system at first year itself. The semester system helps in accelerating the teaching-learning process and enables vertical and horizontal mobility in learning.

The credit based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The choice based credit system provides a 'cafeteria' type approach in which the students can take courses of their choice, learn at their own pace, undergo additional courses and adopt an interdisciplinary approach to learning.

Choice Based Credit System (CBCS) is a flexible system of learning and provides choice for students to select from the prescribed elective courses. A course defines learning objectives and learning outcomes and comprises of Lectures / Tutorials / Laboratory Work / Field Work / Project Work / MOOCS / Internship / Comprehensive Examination / Seminars / Presentations / self-study etc. or a combination of some of these.

Under the CBCS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.

The CBCS permits students to:

1. Choose electives from a wide range of elective courses offered by the departments.
2. Undergo additional courses of interest.
3. Adopt an interdisciplinary approach in learning.
4. Make the best use of expertise of the available faculty.

**6. Medium of instruction:**

The medium of instruction shall be English for all courses, examinations, seminar presentations and project work. The curriculum will comprise courses of study as given in course structure, in accordance with the prescribed syllabi.

**7. Types of Courses:**

Courses in a programme may be of five kinds: **Foundation, Skill, Core, Elective and Mandatory.**

**7.1 Foundation / Skill Course:**

Foundation courses are the courses based upon the content leads to enhancement of skill and knowledge. Skill subjects are those areas in which one needs to develop a set of skills to learn anything at all. They are fundamental to learn any subject.

**7.2 Core Course:**

There may be a core course in every semester. This is the course which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

### 7.3 Elective Course:

Electives provide breadth of experience in respective branch and applications areas. Elective course is a course which can be chosen from a pool of courses. It may be:

- Supportive to the discipline of study
- Providing an expanded scope
- Enabling an exposure to some other discipline / domain
- Nurturing student's proficiency / skill.

An elective may be discipline centric (Professional Elective) focusing on those courses which add generic proficiency to the students or may be chosen from an interdisciplinary area called as "Open Elective".

There are five professional elective groups. Students can choose not more than one elective from each of the five groups. Also there are four open elective groups, students can choose not more than one elective from each of the four groups.

## 8. Academic Year:

### 8.1 Course Duration:

8.1.1 Course duration for B. Tech program of study is 4 years and the maximum duration to complete the program is 8 years excluding the gap year.

8.1.2 For lateral entry students the course duration is 3 years and the maximum duration to complete the program is 6 years excluding the gap year.

**8.2** Each academic year is divided into two semesters and each semester shall have a minimum of 16 Instructional Weeks.

## 9. Unique course identification code:

Every course of the B. Tech program will be placed in one of the eleven groups of courses as listed in the table 1. The various courses and their two-letter codes are given below.

**Table 1: Group of Courses**

| S.No. | Branch | Code |
|---|---|---|
| 1 | Civil Engineering | CE |
| 2 | Electrical and Electronics Engineering | EE |
| 3 | Mechanical Engineering | ME |
| 4 | Electronics and Communication Engineering | EC |
| 5 | Computer Science and Engineering | CS |
| 6 | Information Technology | IT |
| 7 | Computer Science and Engineering(Artificial Intelligence and Machine Learning) | CM |

| | | |
|---|---|---|
| 8 | Computer Science and Engineering(Data Science) | CD |
| 9 | Humanities and Basic Sciences | HS |
| 10 | MBA | MB |
| 11 | MCA | MC |

**10. Curriculum and Course Structure:**

The curriculum shall comprise Foundation / Skill Courses, Core Courses, Elective Courses, Laboratory Courses, Audit Courses, Mandatory Courses, Comprehensive Examination / Mini Project, Internship and Project work. The list of elective courses may include subjects from allied disciplines also.

**Assigning of Credits:** Depending on the complexity and volume of the course, the number of contact hours per week will be assigned. Each Theory and Laboratory course carries credits based on the number of hours / week as follows.

- **Contact classes (Theory):** 1 credit per lecture hour per week.
- **Laboratory Hours (Practical):** 1 credit for 2 Practical hours, per week.

**10.1 Course Structure:**

Every program of study shall be designed to have 38-42 theory courses and 17-22 laboratory courses. Every course of the B.Tech program will be placed in one of the eight categories with average credits as listed in the Table 2. In this, a student has to carry out a mini project, project work and comprehensive Examination also.

**Table 2: Category-wise Distribution of Credits**

| S.No. | Category | Subject Area and % of Credits | Average No. of Credits |
|---|---|---|---|
| 1 | Humanities and Social Sciences (HS), including Management courses | HS (05% to 10%) | 10.5 |
| 2 | Basic Sciences (BS) including Mathematics, Physics and Chemistry. | BS (15% to 20%) | 21 |
| 3 | Engineering Sciences (ES), including Workshop, Drawing, Basics of Electrical / Electronics / Mechanical / Computer Engineering. | ES (15% to 20%) | 24 |
| 4 | Professional Subjects-Core (PC), relevant to the chosen specialization / branch. | PC (30% to 40%) | 51 |

| | | | |
|---|---|---|---|
| 5 | Professional Elective Courses (PE), relevant to the chosen specialization / branch. | PE (10% to 15%) | 15 |
| 6 | Open Elective Courses (OE), from other technical and / or emerging subject area. | OE (05% to 10%) | 12 |
| 7 | Project Work, Internship Mini Project / Comprehensive Examination. | 10% to 15% | 16.5 |
| 8 | Mandatory Courses | MC | Non-credit |
| 9 | Skill Oriented Courses | SC | 10 |
| **TOTAL** | | | **160** |

**10.2** There shall be mandatory student induction program for freshers, with a three-week duration before the commencement of first semester. Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept./Branch & Innovations etc., as per the guidelines issued by AICTE.

**10.3** All undergraduate students shall register for NCC / NSS activities. A student will be required to participate in an activity for two hours in a week during second and third semesters. Grade shall be awarded as Satisfactory or Unsatisfactory in the grade sheet on the basis of participation, attendance, performance and behavior. If a student gets an unsatisfactory Grade, he shall repeat the above activity in the subsequent semesters, in order to complete the degree requirements.

**10.4** Courses like Environmental Science, Universal Human Values, Ethics, Indian Constitution, Essence of Indian Traditional Knowledge etc., are included in the curriculum as non-credit mandatory courses. Environmental Science is offered as mandatory course for all branches. A student has to secure 40% of the marks allotted in the internal evaluation for passing the course. No marks or letter grade shall be allotted for all mandatory non-credit courses.

**10.5** There shall be 05 Professional Elective courses and 04 Open Elective courses. All the Professional & Open Elective courses shall be offered for 03 credits. All Open Electives are offered to students of all branches in general. However, a student shall choose an open Elective from the list in such a manner that he has not studied the same course in any form during the Programme.

**10.6** A student shall be permitted to pursue up to a maximum of two open elective courses under MOOCs during the Programme as mentioned in course structure. Each of the courses must be of minimum 8 - 12 weeks in duration. Attendance will not be monitored for MOOC courses. Student has to pursue and acquire a certificate for a MOOC course only from the organizations/agencies approved by the BoS in order to earn the 3 credits. The Head of the department shall notify the list of such courses at the beginning of the semester.

**10.6.1** In case a student fails to complete the MOOC / MOOCs in the stipulated semester he has to re-register and complete the same. In case any provider discontinues the course, Institution shall allow the student to opt for any other course from the list provided by the department from time to time.

**10.6.2** Students have to acquire a certificate from the agencies approved by the BOS with grading or percentage of marks in order to earn 3 credits.

**10.6.3** The certificate submitted by the student will be duly verified and attested by the concerned BOS chairman, and the same will be forwarded to examination branch before the end of the stipulated semester.

**10.7** The department shall invite registration forms from the students at the beginning of the semester for offering professional and open elective courses. Elective course shall be offered by the Department only if a minimum of 20 percent of students in the class / section strength register for that course.

**10.8** Students shall undergo mandatory summer internships for a minimum of six weeks duration at the end of second and third year of the Programme. There shall also be mandatory full internship in the final semester of the Programme along with the project work.

**10.9** There shall be 05 skill-oriented courses offered during II B.Tech I Semester to IV B.Tech I Semester. Among the five skill courses, four courses shall focus on the basic and advanced skills related to the domain courses and the remaining one shall be a soft skills course.

**10.10** Under graduate Degree with Honors/Minor shall be issued by the University, upon the recommendation of the college, to the students who fulfill all the academic eligibility requirements for the B.Tech program and Honors/Minor program. The objective is to provide additional learning opportunities to academically motivated students.

**11. Evaluation Methodology:**

**11.1 Theory Course:**

Each theory course will be evaluated for a total of 100 Marks, with 40 Marks for Continuous Internal Assessment (CIA) and 60 Marks for Semester End Examination (SEE).

**11.2 Continuous Internal Assessment (CIA):**

The distribution of marks for Continuous Internal Assessment is as follows:

Two Sessional Examinations : 30 Marks

| | | |
|---|---|---|
| Five Assignments | : | 10 Marks |
| | | 40 Marks |

**11.3 Question Paper Pattern for Sessional Examinations:**

**11.3.1** Each sessional exam question paper consists of two parts, namely Part A and Part B. Part A is compulsory which carries 10 marks and consists of five short answer type questions with each carrying 2 marks. In Part B, 4 essay type questions with internal choice (either or type) each carrying 5 marks may be given. The questions may be set as per Bloom's Taxonomy. Time duration for each sessional exam is 2 hours. Internal marks for sessional examinations shall be arrived at by considering the marks secured by the student in both the sessional examinations with 80% weightage to the better sessional exam and 20% to the other.

**11.3.2** Five assignments, each one for 10 marks shall be given to the students at the end of each unit. Internal marks for the assignments shall be awarded by considering the average of the five assignments.

**11.4 Semester End Examination (SEE):**

The SEE is conducted for 60 marks of 3 hours duration. The syllabus for the theory course is divided into FIVE units. SEE Question Paper consists of two parts, Part A and Part B.

Part A consists of 05 short answer type questions, each carries 2 marks for a total of 10 marks with no choice.

Part B Consists of 5 questions with one question from each of the 5 units with internal choice with 10 marks for each question.

The emphasis on the questions is broadly based on objective skill, analytical skill and application skill following the outcome based education.

**11.5 Laboratory Course:**

Each Laboratory Course will be evaluated for a total of 100 marks, consisting of 40 marks for internal assessment (CIA) and 60 marks for semester end lab examination. Out of 40marks of CIA, continuous lab assessment (SEE) for day to day performance will be done for 20 marks, final internal lab examination carries 15 marks and Viva-Voce carries 5 marks. The semester end lab examination for 60 marks shall be conducted by two examiners, one of them being internal examiner (subject teacher) and the other being external examiner (other than the teacher handled) to be nominated by the Principal from the panel of experts as recommended by the Chairman, BOS. The scheme of valuation for the 60 Marks will be informed to the students in advance by the concerned Chairman, BOS and displayed in the laboratory during the beginning of the semester.

**11.6. Drawing Courses:**

All the **drawing** related courses are evaluated in line with laboratory courses. The distribution shall be 40 marks for internal evaluation (20 marks for day to day work and 20 marks for final internal test) and 60 marks for semester end examinations.

- **Question paper pattern for drawing courses will be followed as mentioned in the syllabus.**

  The following course is considered as theory subject, but for all practical purposes examination will be conducted like practical.

  i. Computer Aided Engineering Drawing

**11.7 Mandatory Courses:**

Mandatory courses will not carry any credits; but, a pass in the examination during the programme shall be necessary requirement for student to qualify for the award of Degree. The student is declared pass in each such course after securing 40% of the marks in internal examination. Evaluation will be done by conducting descriptive examination at the end of the semester for 100 marks, internally.Its result shall be declared with "satisfactory" (Pass) or Not Satisfactory (Fail) performance.Attendance is mandatory for these courses**.**

The examination will be conducted for 100 marks of 3 hours duration. The syllabus for the course is divided into FIVE units. The Question Paper consists of two parts, Part A and Part B. Part A consists of 5 short answer type questions, each carries 5 marks for a total of 25 marks with no choice.Part B Consists of 5 questions with one question from each of the 5 units with internal choice with 15 marks for each question.

The emphasis on the questions is broadly based on objective skill, analytical skill and application skill following the outcome based education.

**11.8 Community Service Project:** Community Service Project should be an integral part of the curriculum, as an alternative to the 2 months of Summer Internships / Apprenticeships / On the Job Training, whenever there is an exigency when students cannot pursue their summer internships.

**11.9 Project Work:**

There shall be a Project Work in the IV year second semester which carries 12 credits. Out of 100 marks allotted for the project work, 40 marks shall be for Internal Evaluation and 60 marks for the End Semester Examination (Viva – Voce). The Viva – Voce shall be conducted by a committee consisting of HOD, Project Supervisor and an External Examiner nominated by the

Principal from the panel of examiners recommended by Chairman, BOS. The Evaluation of project work shall be conducted at the end of the IV year – II semester. The Internal Evaluation shall be made by the departmental committee, on the basis of two seminars given by each student on the topic of his project.

**11.10 Framework for Mandatory Internships:**

**11.10.1** Two summer internships each with a minimum of six weeks duration, done at the end ofsecond and third years, respectively are mandatory. The internship can be done by the students at local industries, Govt. Organizations, construction agencies, Industries, Hydel andthermal power projects and also in software MNCs.

**11.10.2** Evaluation of the summer internships shall be through the departmental committee. A student will be required to submit a summer internship report to the concerned departmentand appear for an oral presentation before the departmental committee. The report and theoral presentation shall carry 40% and 60% weightages respectively.

**11.10.3** In the final semester, the student should mandatorily undergo internship and parallelly he should work on a project with well-defined objectives. At the end of the semester the candidate shall submit an internship completion certificate and a project report. A student shall also be permitted to submit project report on the work carried out during the internship. The project report shall be evaluated with an external examiner.

**11.10.4** The College shall facilitate and monitor the student internship programs. Completion of internships is mandatory, if any student fails to complete internship, he will not be eligible for the award of degree. In such cases, the student shall repeat and complete the internship.

**11.11 Framework for Skill Oriented Courses:**

**11.11.1** For skill oriented/skill advanced courses, one theory and 2 practical hours or two theory hours may be allotted as per the decision of concerned BOS.

**11.11.2** Out of the five skill courses two shall be skill-oriented courses from the same domain and shall be completed in second year. Of the remaining 3 skill courses, one shall be necessarily be a soft skill course and the remaining 2 shall be skill-advanced courses either from the same domain or Job oriented skill courses, which can be of inter disciplinary nature.

**11.11.3** A pool of interdisciplinary job-oriented skill courses shall be designed by a Common Board of studies by the participating departments / disciplines and the syllabus along with the prerequisites shall be prepared for each of the laboratory infrastructure requirements. The list of such courses shall be included in the curriculum structure of each branch of Engineering, so as to enable the student to choose from the list.

**11.11.4** The student shall be given an option to choose either the skill courses being offered by the college or to choose a certificate course being offered by industries / Professional bodies / APSSDC or any other accredited bodies as approved by the concerned BoS.

**11.11.5** The Board of studies of the concerned discipline of Engineering shall review the skill advanced courses being offered by eligible external agencies and prepare a fresh list every year incorporating latest courses based on industrial demand.

**11.11.6** If a student chooses to take a Certificate Course offered by industries / Professional bodies / APSSDC or any other accredited bodies, in lieu of the skill advanced course offered by the Department, the credits shall be awarded to the student upon producing the Course Completion Certificate from the agency / professional bodies as approved by the Board of studies.

**11.11.7** If a student prefers to take a certificate course offered by external agency, the department shall mark attendance of the student for the remaining courses in that semester excluding the skill course in all the calculations of mandatory attendance requirements upon producing a valid certificate as approved by the concerned Board of Studies, the student is deemed to have fulfilled the attendance requirement of the course and acquire the credits assigned to the course.

**11.11.8** A committee shall be formed at the level of the college to evaluate the grades / marks given for a course by external agencies and convert to the equivalent marks / grades. There commended conversions and appropriate grades/marks are to be approved by the Academic Council.

**11.12 Gap Year:**

Gap Year – concept of Student Entrepreneur in Residence shall be introduced and outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time after II year to pursue entrepreneurship full time. This period may be extended to two years at the most and these two years would not be counted for the time for the maximum time for graduation. The HOD of the respective department shall forward such proposals submitted by the students to the Principal. An evaluation committee shall be constituted by the Principal to evaluate the proposal submitted by the student and the committee shall decide whether or not to permit student (s) to avail the Gap Year.

**11.13 Frame work for Minor Degree in a Discipline (Minor Degree / Programme):**

The concept of Minor degree is introduced in the curriculum of all B. Tech. programs offering a Major degree. The main objective of Minor degree in a discipline is to provide additional learning opportunities for academically motivated students and it is an optional feature of the B.Tech Program. In order to earn a Minor degree in a discipline, a student has to earn 20 extra credits, by studying FIVE courses each carrying four credits (in each course, three credits for theory and one credit for lab).

**a)** Students who are desires of pursuing their special interest areas other than the chosen discipline of Engineering may opt for additional courses in minor specialization groups offered by a department other than their parent department. For example, if Mechanical Engineering student selects subjects from Civil Engineering under this scheme, he will get Major degree of Mechanical Engineering with minor degree of Civil Engineering.

**b)** Student can also opt for industry relevant tracks of any branch to obtain the minor degree. For example, a B.Tech Mechanical Engineering student can opt for the industry relevant tracks like Data Mining track, IOT track, Machine learning track, etc.

**11.13.1** Students having a CGPA of 8.0 or above up to II B.Tech I-Semester without any backlogs shall be permitted to register for Minor degree.

**11.13.2** An SGPA and CGPA of 8.0 has to be maintained in the subsequent semesters without any backlog subjects in order to keep the Minor discipline registration live or else it shall be cancelled.

**11.13.3** Students aspiring for a Minor degree must register from II B.Tech II-Semester onwards and must opt for a Minor in a discipline other than the discipline he is registered in or any industry relevant track of any branch.

**11.13.4** The Evaluation pattern of the courses shall be similar to the regular program courses evaluation.

**11.13.5** Minimum strength required for offering a Minor in a discipline is considered as 20% of the class size and Maximum should be 80% of the class size.

**11.13.6** Minor degree program should be completed by the end of IV B. Tech I-Semester.

**11.13.7** A student registered for Minor degree shall pass in all subjects that constitute the requirement for the Minor degree program. No class / division (i.e., second class, first class and distinction, etc.) shall be awarded for Minor degree program.

**11.13.8** The Minor degree shall be mentioned in the degree certificate as Bachelor of Technology in XXX with Minor in YYY. For example, Bachelor of Technology in Computer Science & Engineering with Minor in Electronics & Communication Engineering or the chosen industry relevant track. This shall also be reflected in the transcripts, along with the list of courses taken for Minor degree program with CGPA mentioned separately.

**11.13.9** Separate course/class work and time table shall be arranged for the various Minor degree programs. Attendance regulations for these Minor discipline programs shall be as per regular courses.

**NOTE**: Interested meritorious students shall be permitted to register either for Minor degree in a discipline or industry relevant track of any branch (or) Honors Degree in a discipline only, but not both.

**11.14 Framework for Honors Degree in a Discipline**:

**11.14.1** This concept is introduced in the curriculum for all conventional B. Tech. programmes.

The main objective of Honors degree in a discipline is to provide additional learning opportunities for academically motivated students and it is an optional feature of the B. Tech. programme. In order to earn a Honors degree in his/her discipline, a student has to earn 20 extra credits by studying five advanced courses each carrying four credits for 20 credits in the concerned branch of Engineering. In place of advanced courses, he can study equivalent MOOC courses available under SWAYAM / Other platform, as decided by the institution from time to time. The Evaluation pattern of theory subjects will be similar to the regular programme evaluation. Students aspiring for Honors degree must register from II B.Tech, II Semester onwards. However, Honors degree registrations are not allowed before II B.Tech, II Semester and after III B.Tech, I Semester.

**11.14.2** Students having a CGPA of 8.0 or above up to II year-I semester and without any backlog subjects will be permitted to register for degree with Honors. The SGPA and CGPA of 8.0 has to be maintained in the subsequent semesters without any backlog subjects in order to keep the degree with Honors registration live or else it will be cancelled.

**NOTE:** Interested meritorious students shall be permitted to register either for Honors degree or Minor degree in a discipline or industry relevant track of any branch but not both.

**12. Attendance Requirements and Detention Policy:**

**12.1** A student shall be eligible to appear for Semester – End examinations if he acquires a minimum of 40% in each subject and 75% of attendance in aggregate of all the subjects in a semester.

**12.2** 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.

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

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

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

**13. Conduct of Semester End Examination and Evaluation:**

**13.1** Semester end examination shall be conducted by the Controller of Examination (COE) by inviting 50% Question Papers from the External and 50% Question papers from the Internal Subject Experts. Principal will decide the External and Internal subject experts.

**13.2** The answer papers of semester end examination should be evaluated externally / internally.

**13.3** 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.

**13.4** Performance in all the subjects is tabulated program-wise and will be scrutinized by the office of the Controller of Examinations. Total marks obtained in each subject are converted into letter grades. Finally subject-wise marks and grades details, subject-wise and branch-wise pass percentages are calculated through software.

**13.5 Results Committee:**

Results Committee comprising of Principal, Controller of Examinations, Additional Controller of Examinations (Confidential), One Senior Professor nominated by the Principal and the University Nominee will oversee the details of marks, grades and pass percentages of all the subjects and branch-wise pass percentages.

**13.6** Office of the Controller of Examinations will generate student-wise result sheets and the same will be published through college website.

**13.7** Student-wise Grade Sheets are generated and issued to the students.

**14. Academic Requirements for Promotion / Completion of Regular B.Tech Programme 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.

**14.1 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 **33** 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 II-Year I semester.
d) One Regular Examination of II-Year II Semester.

Irrespective of whether the candidate 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 **50** 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 II-Year I Semester.

d) Two Regular and One Supplementary Examinations II-Year II Semester.

e) One Regular and One Supplementary examination of III-Year I Semester.

f) One Regular Examination of III-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 14.1 (ii) and 14.1 (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 **160** credits and earn all the **160** credits. Marks obtained in all the **160** credits shall be considered for the award of the class based on CGPA.

v. A student who fails to earn **160** 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.

vi. A student will be eligible to get under graduate degree with Honours or additional Minor Engineering, if he completes an additional **20** credits.

vii. A student will be permitted to register either for Honours degree or additional Minor Engineering but not both.

**14.2 For Lateral Entry Students:**

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 **34** 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 III-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.

**iii.** A student shall register for all **121** credits and earn all the **121** credits. Marks obtained in all **121** credits shall be considered for the award of the class based on CGPA.

**iv.** A student who fails to earn **121** 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.

**v.** A student will be eligible to get under graduate degree with Honours or additional Minor Engineering, if he completes an additional **20** credits.

**vi.** A student will be permitted to register either for Honours degree or additional Minor Engineering but not both.

**15. Letter Grades and Grade Points:**

**15.1** Performances of students in each course are expressed in Letter Grades based on absolute grading system. The UGC recommends a 10-point grading system with the following letter grades as given in the Table 3.

**Table 3: Grade Points Scale (Absolute Grading)**

| Percentage of Marks | Grade Point | Letter Grade |
|---|---|---|
| 90-100 | 10 | S (Outstanding) |
| 80-89 | 9 | A+ (Excellent) |
| 70-79 | 8 | A (Very Good) |
| 60-69 | 7 | B+ (Good) |
| 50-59 | 6 | B (Above Average) |
| 45-49 | 5 | C (Average) |
| 40-44 | 4 | D (Pass) |
| Below 40 | 0 | F (Fail) |
| Absent | 0 | N (Absent) |

**15.2** A student obtaining Grade F shall be considered Failed and will be required to re-appear in the examination.

**15.3** For non credit courses, 'P' for 'Satisfactory' or 'F' for 'Not Satisfactory' is indicated and this will not be counted for the computation of SGPA / CGPA.

**15.4** At the end of each semester, the institute issues grade sheet indicating the SGPA and CGPA of the student. However, grade sheet will not be issued to the student if he has any outstanding dues.

**16.0 Computation of SGPA and CGPA:**

**16.1** The Semester Grade Point Average (SGPA) is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

$$SGPA = \Sigma (Ci \times Gi) / \Sigma C_i$$

where, Ci is the number of credits of the ith subject and Gi is the grade point scored by the student in the ith course

**16.2** The Cumulative Grade Point Average (CGPA) will be computed in the same manner taking into account all the courses undergone by a student over all the semesters of a program, i.e.

$$CGPA = \Sigma (C_i \times S_i) / \Sigma C_i$$

where '$S_i$' is the SGPA of the $i^{th}$ semester and $C_i$ is the total number of credits in that semester

**16.3** Both SGPA and CGPA shall be rounded off to 2 decimal points and reported in the Grade Sheets.

**16.4** While computing the SGPA/CGPA, the subjects in which the student is awarded Zero grade points will also be included.

**16.5** Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

**16.6** Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters S, A+, A, B+, B, C, D, F and N.

**16.7** As per AICTE regulations, conversion of CGPA into equivalent percentage is as follows:

**Equivalent Percentage to SGPA = (SGPA – 0.50) x 10**

**Equivalent Percentage to CGPA = (CGPA – 0.50) x 10**

**17. Grade Sheet:**

A grade sheet will be issued to each student indicating his performance in all subjects registered in that semester indicating the SGPA and CGPA. SGPA and CGPA will be rounded off to the second place of decimal.

**18. 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.

**19. 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

**19.1 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 4.0 (Minimum requirement for declaring as passed.)

**19.2. Award of Class:**

**Declaration of Class is based on CGPA**

| **Cumulative Grade Point Average** | **Class** |
|---|---|
| ≥7.5 | First Class with Distinction |
| ≥6.5 and<7.5 | First Class |
| ≥5.5 and <6.5 | Second Class |
| ≥4.0 and<5.5 | Pass Class |

**20. Personal Verification /Recounting / Revaluation / Final Valuation**

**20.1 Personal Verification of Answer Scripts:**

Candidates appear in a particular semester end examinations may appeal for verification of their answer script(s) for arithmetic correction in totaling of marks and any omission / deletion in evaluation as per the notifications issued from time to time in the prescribed proforma and by paying the prescribed fee per answer script.

It is clarified that personal verification of answer script shall not tantamount to revaluation of answer script. This is only a process of reverification by the candidate. Any mistake / deficiency with regard to arithmetic correction in totaling of marks and any omission / deletion in evaluation if found, the institution will correct the same.

**20.2 Recounting / Revaluation:**

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.

**20.3 Final Valuation:**

Students shall be permitted for request for final valuation of the Semester–End Examination answer scripts within a stipulated period after the publication of the revaluation results by paying the necessary fee. The final valuation shall be carried out by an expert not less than Associate Professor as per the scheme of valuation supplied by the examination branch in the presence of the student, Controller of Examinations and Principal. However students are not permitted to discuss / argue with the examiner. If the increase in marks after final valuation is equal to or more than 15% of the previous valuation marks, the marks obtained after final valuation shall be treated as final. If the variation of marks after final valuation is less than 15% of the previous valuation marks, then the earlier valuation marks shall be treated as the final marks.

**21. Supplementary Examinations:**

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

**22. Termination from the Program:**

The admission of a student to the program may be terminated and the student is asked to leave the institute in the following circumstances:

a. The student fails to satisfy the requirements of the program within the maximum period stipulated for the program.
b. The student fails to satisfy the norms of discipline specified by the institute from time to time.

**23. With-Holding of Results:**

If the candidate has not paid any dues to the institute / if any case of indiscipline / malpractice is pending against him, the results of the candidate will be withheld. The issue of the degree is liable to be withheld in such cases.

**24. Graduation Day:**

The institute shall have its own annual Graduation Day for the award of Provisional Certificates to students completing the prescribed academic requirements in each case, in consultation with the University and by following the provisions in the Statute. The college shall institute prizes and medals to meritorious students and award them annually at the Graduation Day. This will greatly encourage the students to strive for excellence in their academic work.

**25. Discipline:**

Every student is required to observe discipline and decorum both inside and outside the institute and not to indulge in any activity which will tend to bring down the honor of the institute. If a student indulges in malpractice in any of the theory / practical examination, continuous assessment examinations he shall be liable for punitive action as prescribed by the Institute from time to time.

**26. Grievance Redressal Committee:**

The institute shall form a Grievance Redressal Committee for each course in each department with the Course Teacher and the HOD as the members. This Committee shall solve all grievances related to the course under consideration.

**27. 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.

**28. Mode of Learning:**

Preferably 50% course work for the Theory courses in every semester shall be conducted in the blended mode of learning. If the blended learning is carried out in online mode, then the total attendance of the student shall be calculated considering the offline and online attendance of the student.

**29. Student Transfers:**

Student transfers shall be as per the guidelines issued by the Government of Andhra Pradesh and the University from time to time.

Students admitted on transfer from JNTU affiliated institutes, Universities and other institutes are required to pass all the subjects studied in the previous institution. Further, the students who have passed some of the subjects at the earlier institution, if the same subjects are prescribed in different semesters in the transferred institutions, the student has to study the substitute subjects as prescribed by concerned 'Board of Studies'.

**30. General Instructions:**

i. The academic regulations should be read as a whole for purpose of any interpretation.

ii. Disciplinary action for Malpractice/improper conduct in examinations is appended.

iii. Where the words "he", "him", "his", occur in the regulations, they include"she", "her","hers".

iv. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Principal is final.

v. The Principal may change or amend the academic regulations of common BOS or syllabi at any time and the changes or amendments shall be made applicable to all the students on rolls with effect from the dates notified by the Principal.

vi. The above rules and regulations are to be approved/ratified by the College Academic Council as and when any modification is to be done.

**FAILURE TO READ AND UNDERSTAND THE REGULATIONS IS NOT AN EXCUSE**

# ANNEXURE – I

# COMMUNITY SERVICE PROJECT

***Allocation of Community Service Project for the students will be done as per the decision of the concerned BOS Chairman***

## Introduction:

Community Service Project is an experiential learning strategy that integrates meaningful community service with instruction, participation, learning and community development.

Community Service Project involves students in community development and service activities and applies the experience to personal and academic development.

Community Service Project is meant to link the community with the college for mutual benefit. The community will be benefited with the focused contribution of the college students for the village/ local development. The college finds an opportunity to develop social sensibility and responsibility among students and also emerge as a socially responsible institution.

## Objective:

Community Service Project should be an integral part of the curriculum, as an alternative to the 2months of Summer Internships / Apprenticeships / On the Job Training, whenever there is an exigency when students cannot pursue their summer internships. The specific objectives are;

- To sensitize the students to the living conditions of the people who are around them,

- To help students to realize the stark realities of the society.

- To bring about an attitudinal change in the students and help them to develop societal consciousness, sensibility, responsibility and accountability.

- To make students aware of their inner strength and help them to find new /out of box solutions to the social problems.

- To make students socially responsible citizens who are sensitive to the needs of the disadvantaged sections.

- To help students to initiate developmental activities in the community in coordination with public and government authorities.

- To develop a holistic life perspective among the students by making them study culture, traditions, habits, lifestyles, resource utilization, wastages and its management, social problems, public administration system and the roles and responsibilities of different persons across different social systems.

## Implementation of Community Service Project:

- Every student should put in a minimum of 180 hours for the Community Service Project during the summer vacation.

- Each class/section should be assigned with a mentor.

- Specific Departments could concentrate on their major areas of concern. For example, Dept. of Computer Science can take up activities related to Computer Literacy to different sections of people like - youth, women, house-wives, etc

- A log book has to be maintained by each of the student, where the activities undertaken/involved to be recorded.
- The log book has to be countersigned by the concerned mentor/faculty in-charge.

- Evaluation to be done based on the active participation of the student and grade could be awarded by the mentor/faculty member.

- The final evaluation to be reflected in the grade memo of the student.

- The Community Service Project should be different from the regular programmes of NSS / NCC / Green Corps / Red Ribbon Club etc.,

- Minor project report should be submitted by each student. An internal Viva shall also be conducted by a committee constituted by the principal of the college.

- Award of marks shall be made as per the guidelines of Internship/apprentice/ on the job training

## Procedure:

- A group of students or even a single student could be assigned for a particular habitation or village or municipal ward, as far as possible, in the near vicinity of their place of stay, so as to enable them to commute from their residence and return back by evening or so.

• The Community Service Project is a twofold one –

- First, the student/s could conduct a survey of the habitation, if necessary, in terms of their own domain or subject area. Or it can even be a general survey, incorporating all the different areas. A common survey format could be designed. This should not be viewed as a duplication of work by the village or ward volunteers, rather, it could be another primary source of data.

- *Secondly, the student/s could take up a social activity, concerning their domain or* subject area. The different areas, could be like –

    - *Agriculture*
    - *Health*
    - *Marketing and Cooperation*
    - *Animal Husbandry*
    - *Horticulture*
    - *Fisheries*
    - *Sericulture*
    - *Revenue and Survey*
    - *Natural Disaster Management*
    - *Irrigation*
    - *Law & Order*
    - *Excise and Prohibition*
    - *Mines and Geology*
    - *Energy*
    - *Internet*
    - *Free Electricity*
    - *Drinking Water*

**EXPECTED OUTCOMES:**

**BENEFITS OF COMMUNITY SERVICE PROJECT TO STUDENTS:**

**Learning Outcomes:**

- Positive impact on students' academic learning
- Improves students' ability to apply what they have learned in "the real world"
- Positive impact on academic outcomes such as demonstrated complexity of understanding, problem analysis, problem-solving, critical thinking, and cognitive development
- Improved ability to understand complexity and ambiguity Personal Outcomes
- Greater sense of personal efficacy, personal identity, spiritual growth, and moral development
- Greater interpersonal development, particularly the ability to work well with others, and build leadership and communication skills Social Outcomes
- Reduced stereotypes and greater inter-cultural understanding
- Improved social responsibility and citizenship skills
- Greater involvement in community service after graduation Career Development
- Connections with professionals and community members for learning and career opportunities
- Greater academic learning, leadership skills, and personal efficacy can lead to greater Opportunity Relationship with the Institution
- Stronger relationships with faculty
- Greater satisfaction with college
- Improved graduation rates

**BENEFITS OF COMMUNITY SERVICE PROJECT TO FACULTY MEMBERS:**

- Satisfaction with the quality of student learning
- New avenues for research and publication via new relationships between faculty and community
- Providing networking opportunities with engaged faculty in other disciplines or institutions
- A stronger commitment to one's research

**BENEFITS OF COMMUNITY SERVICE PROJECT TO THE INSTITUTION:**

- Improved institutional commitment
- Improved student retention
- Enhanced community relations

**BENEFITS OF COMMUNITY SERVICE PROJECT TO COMMUNITY:**

- Satisfaction with student participation
- Valuable human resources needed to achieve community goals
- New energy, enthusiasm and perspectives applied to community work
- Enhanced community-university relations.

**RULES FOR DISCIPLINARY ACTION FOR MALPRACTICE / IMPROPER CONDUCT IN EXAMINATIONS**

| | **Nature of Malpractices / Improper Conduct** | **Punishment** |
|---|---|---|
| | **If the candidate** | |
| 1.(a) | Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the 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. |
| (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.<br>The Hall Ticket of the candidate is to be cancelled. |
| 3. | 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 to appear for the remaining examinations of the subjects of that Semester/year. |
| 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 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 for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. |

| | | |
|---|---|---|
| 5. | 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 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 for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. |
| 6. | 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 of seat. |
| 7. | 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 practicals 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 University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the impostor is an outsider, he will be handed over to the police and a case is registered against him. |
| 8. | 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 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 |

| | | |
|---|---|---|
| | 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. | them. |
| 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.<br>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. | 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. |
| 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 Examination committee for further action to award suitable punishment. | |

## Program Education Objectives (PEOs)

**PEO – 1**

- To be able to solve wide range of computing related problems in order to cater to the needs of industry and society

**PEO – 2**

- To exhibit analytical decision making and problem solving skills by applying research principles for handling dynamic real time challenges.

**PEO – 3**

- To be able to adapt to the evolving technical challenges and changing career opportunities. Learn to effectively communicate ideas in oral, written, or graphical form to promote collaboration other engineering teams in accordance with social standards and ethical practices.

# PROGRAM OUTCOMES

1. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. 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 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, cultural, societal, and environmental considerations.
4. Use research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

# PROGRAM SPECIFIC OUTCOMES

1. Analyze and recommend the appropriate IT infrastructure required for the implementation of a project
2. Design, develop and test software systems for world-wide network of computers to provide solutions to real world problems.

## Induction Program: 3 weeks
## (Common for All Branches of Engineering)

**Semester-0** **Regulations: R20**

| S.No | Category | Course code | Course title | Hours per week L | T | P | Credits |
|---|---|---|---|---|---|---|---|
| 1 | MC | | Physical Activities -- Sports, Yoga and Meditation, Plantation | 0 | 0 | 6 | 0 |
| 2 | MC | | Career Counseling | 2 | 0 | 2 | 0 |
| 3 | MC | | Orientation to all branches -- career options, tools, etc. | 3 | 0 | 0 | 0 |
| 4 | EC | | Orientation on admitted Branch -- corresponding labs, tools and platforms | 2 | 0 | 3 | 0 |
| 5 | ES | | Proficiency Modules & Productivity Tools | 2 | 1 | 2 | 0 |
| 6 | MC | | Assessment on basic aptitude and mathematical skills | 2 | 0 | 3 | 0 |
| 7 | MC | | Remedial Training in Foundation Courses | 2 | 1 | 2 | 0 |
| 8 | MC | | Human Values & Professional Ethics | 3 | 0 | 0 | 0 |
| 9 | BS | | Communication Skills -- focus on Listening, Speaking, Reading, Writing skills | 2 | 1 | 2 | 0 |
| 10 | ES | | Concepts of Programming | 2 | 0 | 2 | 0 |
| Total | | | | 20 | 3 | 22 | 0 |

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

DEPARTMENT OF INFORMATION TECHNOLOGY

# Course Structure & Scheme of Examination

**I B.Tech I Semester - IT** **Regulations: R20**

| S.No | Category | Course code | Course title | Hours per week | | | Credits | Scheme of Examination Max. Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIA | SEE | Total |
| 1 | BS | 20AHS02 | Differential Equations and Multivariable Calculus | 3 | 1 | 0 | 3 | 40 | 60 | 100 |
| 2 | BS | 20AHS04 | Engineering Physics | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3 | ES | 20ACS01 | C Programming and Data Structures | 3 | 1 | 0 | 3 | 40 | 60 | 100 |
| 4 | ES | 20AME01 | Computer Aided Engineering Drawing | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| 5 | ES | 20ACS02 | Computational Thinking | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 6 | BS | 20AHS07 | Engineering Physics Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 7 | ES | 20ACS03 | C Programming and Data Structures Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 8 | ES | 20AME02 | Engineering Practice Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 9 | MC | 20AHS09 | Environmental Sciences | 2 | 0 | 0 | | 100 | 00 | 100 |
| Total | | | | 15 | 2 | 13 | **19.5** | **420** | **480** | **900** |

**I B.Tech II Semester - IT** **Regulations: R20**

| S.NO | Category | Course code | Course title | Hours per week | | | Credits | Scheme of Examination Max. Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIA | SEE | Total |
| 1 | HS | 20AHS01 | Communicative English | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | BS | 20AHS03 | Engineering Chemistry | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3 | BS | 20AHS08 | Algebra and Transformation Techniques | 3 | 1 | 0 | 3 | 40 | 60 | 100 |
| 4 | ES | 20AEE05 | Basic Electrical Engineering | 3 | 1 | 0 | 3 | 40 | 60 | 100 |
| 5 | ES | 20ACS04 | Problem Solving and Programming using Python | 3 | 1 | 0 | 3 | 40 | 60 | 100 |
| 6 | HS | 20AHS05 | Communicative English Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 7 | ES | 20ACS05 | Problem Solving and Programmingusing Python Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 8 | BS | 20AHS06 | Engineering Chemistry Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 9 | MC | 20AMB01 | Design Thinking | 2 | 0 | 0 | | 100 | 00 | 100 |
| Total | | | | 17 | 3 | 9 | **19.5** | **420** | **480** | **900** |

# Course Structure & Scheme of Examination

**II YEAR I SEMESTER** **Regulations: R20**

| S.NO | Category | Course code | Course title | Hours per week | | | Credits | Scheme of Examination Max. Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIA | SEE | Total |
| 1 | BSC | 20AHS10 | Numerical Methods | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | PCC | 20ACS06 | Computer Organization and Architecture | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3 | PCC | 20ACS07 | Object Oriented Programming through Java | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | PCC | 20AIT01 | Automata and Compiler Design | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 5 | PCC | 20ACS08 | Relational Database Management Systems | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 6 | PCC | 20ACS09 | Object Oriented Programming through Java Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 7 | PCC | 20AIT02 | Automata and Compiler Design Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 8 | PCC | 20ACS10 | Relational Database Management Systems Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 9 | SC | 20AIT03 | Software Development Using Python | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| 10 | MC | 20AMB02 | Universal Human Values-1 | 2 | 0 | 0 | - | 100 | - | 100 |
| 11 | AC | 20AHS11 | Quantitative Aptitude and Reasoning -I | 2 | 0 | 0 | Non-credit | | | |
| 12 | | 20ANCC1/20ANSS1 | NCC/NSS | 0 | 0 | 2 | Non-credit | - | - | - |
| | | | **Total** | **20** | **0** | **13** | **21.5** | **460** | **540** | **1000** |

Honor Degree hours distribution **3-1-0-4**

Minor General Degree hours distribution **3-0-2-4** and Minor Industrial Relevant Track Degree hours distribution **3-1-0-4**

Internship 2 Months (Mandatory) during summer vacation/Community Service project

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

## DEPARTMENT OF INFORMATION TECHNOLOGY

## Course Structure & Scheme of Examination

**II B . TECH II SEM**

| S.NO | Category | Course code | Course title | Hours per week | | | Credits | Scheme of Examination Max. Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIA | SEE | Total |
| 1 | BS | 20AHS13 | Probability and Statistics | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | ES | 20AHS14 | Discrete Structures & Graph Theory | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3 | PCC | 20ACS12 | Design and Analysis of Algorithms | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | PCC | 20ACS13 | Operating Systems | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 5 | PCC | 20AIT04 | Software Engineering | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 6 | PCC | 20ACS14 | Design and Analysis of Algorithms Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 7 | PCC | 20ACS15 | Operating Systems Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 8 | PCC | 20AIT05 | Software Engineering Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 9 | SC | 20AIT06 | Software Development for Portable Devices | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| 10 | AC | 20AHS15 | Quantitative Aptitude and Reasoning -II | 2 | 0 | 0 | Non-credit | - | - | - |
| **TOTAL** | | | | **18** | **0** | **11** | **21.5** | **360** | **540** | **900** |
| | | | | | | | | | | |
| Honor Degree hours distribution **3-1-0-4** | | | | | | | | | | |
| Minor General Degree hours distribution **3-0-2-4** and Minor Industrial Relevant Track Degree hours distribution **3-1-0-4** | | | | | | | | | | |
| Internship 2 Months (Mandatory) during summer vacation/Community Service project | | | | | | | | | | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**DEPARTMENT OF INFORMATION TECHNOLOGY**
**Scheme of Instruction and Examination under R20 Regulations**

**III B.Tech I Semester**

| S.NO | Category | Course code | Course title | Hours per week L | T | P | Credits | Scheme of Examination Max. Marks CIA | SEE | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | PCC | 20ACS16 | Web Technologies | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | PCC | 20ACS17 | Computer Networks | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3 | HSS | 20AMB03 | Managerial Economics andFinancial Analysis | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | OEC | **Open Elective – I** | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 20AEC31 | Digital Logic Design | | | | | | | |
| | | 20AME18 | Robotics and Artificial Intelligence | | | | | | | |
| | | 20ACE35 | Integrated Waste Management for Smart City | | | | | | | |
| | | 20AIT07 | Database Administration | | | | | | | |
| | | 20AIT08 | Effective Programming in Scala | | | | | | | |
| 5 | PEC | **Professional Elective-I** | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 20ACS21 | Computer Graphics | | | | | | | |
| | | 20AIT09 | Information Retrieval and Web Search | | | | | | | |
| | | 20AIT10 | Human Computer Interaction | | | | | | | |
| | | 20ACS18 | Cryptography and Network security | | | | | | | |
| | | 20ACS19 | Advanced computer Architecture | | | | | | | |
| 6 | PCC | 20ACS25 | Web Technologies Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 7 | PCC | 20ACS26 | Computer Networks Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 8 | SC | 20AHS16 | Advanced English Communication skills | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| 9 | MC | 20AHS21 | Indian Constitution | 2 | 0 | 0 | - | 100 | 00 | 100 |
| 10 | AC | 20AHS17 | Quantitative Aptitude and Reasoning -III | 2 | 0 | 0 | - | - | - | - |
| 11 | AC | 20AHS18 | French Language | 2 | 0 | 0 | - | - | - | - |
| | | 20AHS19 | German Language | | | | | | | |
| | | 20AHS20 | Japanese Language | | | | | | | |
| 12 | | 20AIT11 / 20AIT46 | Summer Internship / Community Service Project | | | | 1.5 | 40 | 60 | 100 |
| **Total** | | | | **22** | **0** | **8** | **21.5** | **460** | **540** | **1000** |
| Honors Degree hours distribution **3-1-0-4** | | | | | | | | | | |
| Minor General Degree hours distribution**3-0-2-4** and Minor Industrial Relevant Track Degree hours distribution**3-1-0-4** | | | | | | | | | | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**DEPARTMENT OF INFORMATION TECHNOLOGY**
**Scheme of Instruction and Examination under R20 Regulations**

**III B.Tech II Semester**

| S.NO | Cate gory | Course code | Course title | Hours per week | | | Credits | Scheme of Examination Max. Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIA | SEE | Total |
| 1 | PCC | 20ACS28 | Internet of Things | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | PCC | 20ACS29 | Data Warehousing and Data Mining | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3 | PCC | 20AIT12 | Object Oriented Analysis and Design | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | PEC | | **Professional Elective - II** | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 20AIT13 | Software Project Management | | | | | | | |
| | | 20AIT14 | Bootstrap and Angular JS | | | | | | | |
| | | 20ACM04 | Pattern Recognition | | | | | | | |
| | | 20AIT15 | Internet Protocols | | | | | | | |
| | | 20ACS31 | Ethical Hacking | | | | | | | |
| 5 | OEC | | **Open Elective – II** | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 20AEC45 | Microprocessor and Interfacing | | | | | | | |
| | | 20AMB09 | Intellectual Property Rights | | | | | | | |
| | | 20AME31 | Operations Research | | | | | | | |
| | | 20AIT16 | Game Designing and Development | | | | | | | |
| | | 20AIT17 | Data Exploration using Python | | | | | | | |
| 6 | PCC | 20ACS35 | Data Warehousing and Data mining Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 7 | PCC | 20AIT18 | Object Oriented Analysis and Design Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 8 | PCC | 20ACS37 | Internet of Things Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 9 | SC | 20AIT19 | Introduction to Programming and Animation with alice | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| 10 | MC | 20AHS23 | Essence of Indian Traditional Knowledge | 2 | 0 | - | - | 100 | 00 | 100 |
| **TOTAL** | | | | **18** | **0** | **11** | **21.5** | **460** | **540** | **1000** |
| Honors Degree hours distribution **3-1-0-4** | | | | | | | | | | |
| Minor General Degree hours distribution **3-0-2-4** and Minor Industrial Relevant Track Degree hours distribution **3-1-0-4** | | | | | | | | | | |
| Industrial/Research Internship (Mandatory) 2 Months during summer vacation (to be evaluated during IV year, I Sem) | | | | | | | | | | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**DEPARTMENT OF INFORMATION TECHNOLOGY**
**Scheme of Instruction and Examination under R20 Regulations**

**IV B.Tech I Semester**

| S.NO | Cate gory | Course code | Course title | Hours per week L | T | P | Credits | Scheme of Examination Max. Marks CIA | SEE | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | H & SSE | **Humanities and social science Elective** | | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 20AMB04 | Creativity and Innovation | | | | | | | |
| | | 20AMB05 | Leadership Essentials | | | | | | | |
| | | 20AMB06 | Law for Engineers | | | | | | | |
| | | 20AMB07 | Entrepreneurship Essentials | | | | | | | |
| | | 20AMB08 | Essentials of Management Science | | | | | | | |
| 2 | PEC | | **Professional Elective - III** | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 20AIT20 | Software Testing | | | | | | | |
| | | 20ACS38 | Crypto currencies & Block chain Technologies | | | | | | | |
| | | 20ACS39 | Cloud Computing | | | | | | | |
| | | 20AIT21 | Mobile Application Development | | | | | | | |
| | | 20AIT22 | Information Security | | | | | | | |
| 3 | PEC | | **Professional Elective - IV** | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 20AIT23 | Search Engine Optimization | | | | | | | |
| | | 20AIT24 | Software Quality Assurance and Testing | | | | | | | |
| | | 20AIT25 | Parallel and Distributed Systems | | | | | | | |
| | | 20ACM08 | Deep Learning | | | | | | | |
| | | 20ACS43 | Big Data Analytics | | | | | | | |
| 4 | PEC | | **Professional Elective - V** | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 20AIT26 | Software Architecture | | | | | | | |
| | | 20AIT27 | Agile Software Development | | | | | | | |
| | | 20ACD07 | Data Modeling Techniques | | | | | | | |
| | | 20AIT28 | Software Configuration Management | | | | | | | |
| | | 20ACS46 | Computer Vision | | | | | | | |
| 5 | OEC | | **Open Elective – III** | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 20AEC56 | Embedded systems | | | | | | | |
| | | 20AMB10 | Industrial Marketing | | | | | | | |
| | | 20AME54 | Optimization Techniques | | | | | | | |
| | | 20ACM26 | Machine learning Tools and Techniques | | | | | | | |
| | | 20AIT29 | Semantic Web | | | | | | | |
| 6 | OEC | | **Open Elective – IV** | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 20AEC51 | Digital Image Processing | | | | | | | |
| | | 20AMB11 | Social Media Marketing | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 20AME20 | Total Quality Management and Reliability Engineering | | | | | | | |
| | | 20AIT30 | TCP / IP Design Implementation | | | | | | | |
| | | 20ACS48 | Virtual Reality | | | | | | | |
| 7 | SC | 20AIT31 | C# and .NET Programming | 1 | 0 | 2 | 2 | 40 | 60 | 100 |
| 8 | MC | 20AMB12 | Professional Ethics | 2 | 0 | 2 | - | 100 | 00 | 100 |
| 9 | | 20AIT32 | Industrial / Research Internship | | | | 3 | 40 | 60 | 100 |
| **TOTAL** | | | | **21** | **00** | **04** | **23** | **420** | **480** | **900** |
| Honors Degree hours **3-1-0-4** | | | | | | | | | | |
| Minor General Degree hours distribution **3-0-2-4** and Minor Industrial Relevant Track Degree hours distribution **3-1-0-4** | | | | | | | | | | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**DEPARTMENT OF INFORMATION TECHNOLOGY**
**Scheme of Instruction and Examination under R20 Regulations**

**IV B.Tech., II Semester**

<table>
<tr><th rowspan="2">S. NO</th><th rowspan="2">Category</th><th rowspan="2">Course code</th><th rowspan="2">Course Title</th><th colspan="3">Hours per week</th><th rowspan="2">Credits</th><th colspan="3">Scheme of Examination Max. Marks</th></tr>
<tr><th>L</th><th>T</th><th>P</th><th>CIA</th><th>SEE</th><th>Total</th></tr>
<tr><td rowspan="2">1</td><td>Major Project</td><td>20AIT33</td><td>Project<br>Project work, Seminar and Internship in Industry</td><td>0</td><td>0</td><td>24</td><td>12</td><td>40</td><td>60</td><td>100</td></tr>
<tr><td colspan="10">INTERNSHIP (6 MONTHS)</td></tr>
<tr><td colspan="10">TOTAL CREDITS</td><td>12</td></tr>
</table>

**1.** **HONORS DEGREE:** Students has to acquire 20 credits with minimum one subject from each pool @ 4 credits per subject**.(Offered to IT Department)**

| SNo | Offered in | Course Code | CourseName | L | T | P | C | Scheme of Examination (Maximum Marks) CIA | SEE | Total | Pre-Requisites | Offered To |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | **POOL1** | | | | | |
| 1 | **II-II** (Any 1 Course from POOL-I) | 20ACS53 | Real Time Systems | 3 | 1 | 0 | 4 | 40 | 60 | 100 | Operating systems | CSE |
| 2 | | 20ACS55 | Advanced Databases | 3 | 1 | 0 | 4 | 40 | 60 | 100 | DBMS | CSE |
| 3 | | 20ACS56 | Natural Language Processing | 3 | 1 | 0 | 4 | 40 | 60 | 100 | NIL | CSE |
| 4 | | 20ACD40 | Reverse Engineering | 3 | 1 | 0 | 4 | 40 | 60 | 100 | Computation al Thinking | DS |
| | | | | | | | **POOL 2** | | | | | |
| 1 | **III-I** (Any 1 Course from POOL-II) | 20AIT34 | Digital Design and Practices | 3 | 1 | 0 | 4 | 40 | 60 | 100 | NLP | IT |
| 2 | | 20AIT35 | Sensor Networks | 3 | 1 | 0 | 4 | 40 | 60 | 100 | Networks | IT |
| 3 | | 20AIT36 | Intrusion Detection | 3 | 1 | 0 | 4 | 40 | 60 | 100 | Mining | IT |
| 4 | | 20AIT37 | Cyber Security | 3 | 1 | 0 | 4 | 40 | 60 | 100 | Networks | IT |
| | | | | | | | **POOL 3** | | | | | |
| 1 | **III-II** (Any 1 Course from POOL-III) | 20AIT38 | Neural Networks and Deep learning | 3 | 1 | 0 | 4 | 40 | 60 | 100 | Artificial Intelligence | IT |
| 2 | | 20AIT39 | Convergence Technologies | 3 | 1 | 0 | 4 | 40 | 60 | 100 | Networks | IT |
| 3 | | 20ACD12 | Data Visualization Techniques | 3 | 1 | 0 | 4 | 40 | 60 | 100 | Visualization | DS |
| 4 | | 20ACD42 | Reinforcement Learning | 3 | 1 | 0 | 4 | 40 | 60 | 100 | Computational Thinking | DS |
| | | | | | | | **POOL 4** | | | | | |
| 1 | **III-II** (Any 1 Course from POOL-IV) | 20AIT40 | Knowledge Engineeringand expert systems | 3 | 1 | 0 | 4 | 40 | 60 | 100 | Artificial Intelligence | IT |
| 2 | | 20AIT41 | Cyber Physical System | 3 | 1 | 0 | 4 | 40 | 60 | 100 | OS and CO | IT |
| 3 | | 20AIT42 | Open source programming | 3 | 1 | 0 | 4 | 40 | 60 | 100 | NIL | IT |
| 4 | | 20ACS67 | Speech Processing | 3 | 1 | 0 | 4 | 40 | 60 | 100 | Image Processing | CSE |

| POOL 5 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | **IV-I** (Any 1 Course from POOL-V) | 20AIT43 | Data visualization with tableau | **3** | **1** | **0** | **4** | 40 | 60 | 100 | NIL | IT |
| **2** | | 20AIT44 | Computer Forensics | **3** | **1** | **0** | **4** | 40 | 60 | 100 | NIL | IT |
| **3** | | 20AIT45 | Big Data Analytics with PY SPARK | **3** | **1** | **0** | **4** | 40 | 60 | 100 | NIL | IT |
| **4** | | 20ACS23 | Social Network Analysis | **3** | **1** | **0** | **4** | 40 | 60 | 100 | Data Mining | CSE |

1. **Minor Degree (Industry relevant Track) A student can opt Five subjects from each track @ 4 credits per subject(offered to CSE only)**

**BLOCK CHAIN**

| S.NO | Year & Sem | Course code | Subject | L | T | P | C | PRE-REQ | Offering Department |
|---|---|---|---|---|---|---|---|---|---|
| 1 | II-II | 20ACS73 | Fundamentals of Block chain | 3 | 1 | 0 | 4 | Basics of cryptography | CSE |
| 2 | III-I | 20ACS74 | Smart Contracts and Solidity | 3 | 1 | 0 | 4 | Fundamentals of blockchain and Programming concepts | CSE |
| 3 | III-II | 20ACS75 | Block chain Platforms and Use cases | 3 | 1 | 0 | 4 | NIL | CSE |
| 4 | III-II | 20ACS76 | Block chain Security and Performance | 3 | 1 | 0 | 4 | Security Concepts | CSE |
| 5 | IV-I | 20ACS77 | Block chain and FinTech | 3 | 1 | 0 | 4 | NIL | CSE |
| | | | Total | | | | 20 | | |

## Data Science

| S.NO | Year & Sem | Course code | Subject | L | T | P | C | PRE-REQ | Offering Department |
|---|---|---|---|---|---|---|---|---|---|
| 1 | II-II | 20ACD05 | Data Analytics | 3 | 1 | 0 | 4 | Python, DWDM | CSE |
| 2 | III-I | 20ACD09 | Distributed Database and Information Systems | 3 | 1 | 0 | 4 | Mathematics, statistics, Basics of programming Knowledge | CSE |
| 3 | III-II | 20ACD16 | Data Centre and Networking Technologies | 3 | 1 | 0 | 4 | Computer Network | CSE |
| 4 | III-II | 20ACD18 | Introduction to machine learning: supervised learning | 3 | 1 | 0 | 4 | DWDM | CSE |
| 5 | IV-I | 20ACD31 | Text Analytics | 3 | 1 | 0 | 4 | DWDM | CSE |
| Total | | | | | | | 20 | | |

## Web Designing

| S.NO | Year & Sem | Course code | Subject | L | T | P | C | PRE-REQ | Offering Department |
|---|---|---|---|---|---|---|---|---|---|
| 1 | II-II | 20ACS78 | HTML5 & CSS3 | 3 | 1 | 0 | 4 | NIL | CSE |
| 2 | III-I | 20ACS79 | Web Application Development with PHP | 3 | 1 | 0 | 4 | HTML5 & CSS3 | CSE |
| 3 | III-II | 20ACS80 | Django Framework | 3 | 1 | 0 | 4 | Python | CSE |
| 4 | III-II | 20ACS81 | Full stack React | 3 | 1 | 0 | 4 | Web Technologies | CSE |
| 5 | IV-I | 20ACS82 | Full stack Development using Node.js, Type script | 3 | 1 | 0 | 4 | HTML5,PHP,JAVASCRIPT | CSE |
| Total | | | | | | | 20 | | |

# Cyber Security

| S.NO | Year & Sem | Course code | Subject | L | T | P | C | PRE-REQ | Offering Department |
|---|---|---|---|---|---|---|---|---|---|
| 1 | **II-II** | 20ACS83 | Information Theory for Cyber Security | **3** | **1** | **0** | **4** | CNS | CSE |
| 2 | **III-I** | 20ACS84 | Steganography and Digital Watermarking | **3** | **1** | **0** | **4** | cryptography | CSE |
| 3 | **III-II** | 20ACS85 | Security Policy and Governance | **3** | **1** | **0** | **4** | cryptography | CSE |
| 4 | **III-II** | 20ACS86 | Security Assessment and Risk Analysis | **3** | **1** | **0** | **4** | SE,CRYPTOGRAPHY | CSE |
| 5 | **IV-I** | 20ACS87 | Database Security and Access Control | **3** | **1** | **0** | **4** | DBMS | CSE |
| **Total** | | | | | | | **20** | | |

**Minor Degree:** **a student has to earn 20 extra credits (By studying FIVE theory and FIVE Laboratory courses@ 4 credits)**

| S.NO | Year & Sem | Course Code | Name of the Subject and Lab | L | T | P | C | Offering Department |
|---|---|---|---|---|---|---|---|---|
| **1** | **II-II** | 20ACS88 | Operating system and System Programming | **3** | **0** | **2** | **4** | CSE |
| **2** | **III-I** | 20ACS89 | Database Management System | **3** | **0** | **2** | **4** | CSE |
| **3** | **III-II** | 20ACS90 | R Programming | **3** | **0** | **2** | **4** | CSE |
| **4** | | 20ACS91 | JAVA programming | **3** | **0** | **2** | **4** | CSE |
| **5** | **IV-I** | 20ACS92 | App Development Using Android | **3** | **0** | **2** | **4** | CSE |
| | **Total Credits** | | | | | | **20** | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**I B.Tech I Semester (Common to all Branches)**

| L | T | P | C |
|---|---|---|---|
| **3** | **1** | **0** | **3** |

### 20AHS02 DIFFERENTIAL EQUATIONS AND MULTIVARIABLE CALCULUS

**Course Outcomes:**

After completion of the course the student will be able to

CO1: Classify and interpret the solution of ordinary differential equations.

CO2: Apply the principles of differential equations to the engineering and scientific problems.

CO3: Evaluate the double and triple integral to find surface area and volumes.

CO4: Anlyze the results and draw possible conclusions.

CO5: Illustrate the physical interpretation of concepts of vector calculus.

## UNIT-I

**DIFFERENTIAL EQUATIONS:** Exact differential Equations - Linear Differential Equations – Bernoulli's Equations – Non – homogenous Linear Differential equation of second and higher order with constant coefficients with R.H.S terms of the form $e^{ax}$, $Sinax$, $Cosax$, $x^m$, $e^{ax}V(x)$, $x^mV(x)$ $and$ $xV(x)$.

## UNIT-II

**APPLICATIONS OF DIFFERENTIAL EQUATIONS**: Orthogonal Trajectories (Cartesian and polar forms) - Newton's law of cooling- Law of natural Growth and Decay- L- R-C circuits, bending of beams- Mass spring System

## UNIT-III

**FUNCTIONS OF SEVERAL VARIABLES**: Partial derivatives- chain rule- Total derivative, Jocobian-Maxima and Minima for functions of two variables – Lagrange's method of multipliers of 3 variables only.

## UNIT-IV

**APPLICATIONS OF INTEGRATION**: Length of an arc and area using integral.

**Multiple Integrals**: Double and Triple integrals-Change of variables-Change of order of Integration (Cartesian and polar forms). Surface area and Volume of solid of revolution.

## 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:

1. Higher Engineering Mathematics, Dr.B.S.Grewal,.Kanna Publications, 40th edition.
2. A Text book of Engineering Mathematics –I, T.K.V.Iyengar, B.Krishna Gandhi and others, S. Chand and company.

### Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics. John Wiley & Sons.2016
2. Thomson, A Text book of Engineering Mathematics, Book Collection
3. B.V.Ramana, A Text book of Engineering Mathematics-I, Tata Mc Grawhill.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | - |
| CO2 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | - |
| CO3 | 2 | 2 | - | 1 | - | - | - | - | - | - | - | - | - | 1 |
| CO4 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | - | 1 |
| CO5 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | - |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

**I B.Tech I Semester (Common to EEE, CSE, IT, CSE(DS)&CSE(AI &ML))**
**I B.Tech II Semester (Common to CE, ME, ECE, CAI, CSC & CSO)**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

### 20AHS04 ENGINEERING PHYSICS

**Course Outcomes:**

After completion of the course the student will be able to,

1. Demonstrate strong fundamental knowledge in optic, lasers and optical fibers.
2. Comprehend and apply quantum mechanical principles towards the free electron theory.
3. Learn about the crystal structure, magnetic materials, semiconductors, superconductors and their applications.
4. Propose preparation methods for different nanomaterials and relate structure of nanomaterials with their property.

**UNIT I**

**OPTICS**

**INTERFERENCE:** Introduction - Principle of superposition - Conditions for sustained interference – interference in thin films by reflection – Newton's Rings - Determination of wavelength of light and refractive index of liquid.

**DIFFRACTION:** Introduction–Definition of Fresnel and Fraunhofer diffraction - Fraunhofer diffraction due to single slit and double slit.

**UNIT II**

**LASERS & FIBER OPTICS**

**Lasers:** Introduction - Laser Characteristics - spontaneous and stimulated emission of radiation - Einstein's coefficients - population inversion - Ruby laser - He-Ne laser- Applications of laser. **Fiber Optics:** Introduction - Principle of optical fiber - Acceptance angle and acceptance cone - Numerical aperture - Classification of Optical Fibers-Optical fiber communication system- Applications of optical fibers.

**UNIT III**

**PRINCIPLE OF QUANTUM MECHANICS:** Wave and particles - de Broglie hypotheses - de Broglie's wavelength for electron - Properties of Matter waves -Schrödinger time independent wave equation - Physical significance of wave function -Particle in one dimensional infinite potential box (qualitative only).

**CRYSTAL PHYSICS:** Single crystalline, Polycrystalline and amorphous materials - Fundamental of crystallography- Space lattice - Basis - unit cell - Lattice parameters - Crystal systems –Bravais

Lattice - Structure and packing fraction of Simple cubic and body centered cubic - Miller Indices- Bragg's law- X-ray diffraction by powder method.

**FREE ELECTRON THEORY:** Electrical conductivity of Classical free electron theory and Quantum free electron theory - merits and demerits - Kronig penny model (qualitative only).

**UNIT IV**

**SEMICONDUCTORS & SUPERCONDUCTORS**

**SEMI CONDUCTORS:** Introduction - Intrinsic and extrinsic Semiconductors - Fermi level- Drift and diffusion - Einstein's equation - Hall Effect – LED.

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

**UNIT V**

**MAGNETISM & NANOMATERIALS**

**MAGNETISM:** Introduction and basic definitions - Origin of magnetic moment -Classification of magnetic materials - Hysteresis curve - Hard and Soft Magnetic Materials - Applications.

**NANOMATERIALS**: Introduction - Significance of Nano scale - Types of nanomaterials -Ball milling-Chemical vapor deposition - Properties of nanomaterials, Optical and magnetic – application of nano materials.

**Text Books:**

1. Engineering Physics, Thyagarajan K, Tata Mcgraw Hill Publishers, New Delhi, 2013.
2. A Text book of Engineering Physics, Avadhanulu and Kshirasagar, Revised Edition, S.Chand,New Delhi, 2014.
3. Gaur R K and Gupta S L, Engineering Physics, Dhanpat Rai Publications, New Delhi, 2010.

**Reference Books:**

1. Solid State Physics, Pillai. S.O, , New Age International, New Delhi, 2005.
2. Introduction to Nanoscience and Technology, Chattapadhyay K.K, Banerjee A.N, New Delhi.
3. Engineering Physics, Vijaya kumara K, , S. Chand & Company Ltd., New Delhi .

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | - | 1 | - | - | - | - | - | - | - | - | 2 | 3 |
| **CO2** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 2 | |
| **CO3** | 3 | 2 | - | 1 | - | - | - | - | - | - | - | - | | 3 |
| **CO4** | 2 | - | - | 2 | 1 | - | - | - | - | - | - | - | 2 | - |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**I B.Tech I Semester** (Common to all branches)

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 3 |

## 20ACS01 C PROGRAMMING & DATA STRUCTURES

**Course Outcomes:**

After Completion of the course the student will be able to

CO 1. Analyze the basic concepts of C Programming language.

CO 2. Design applications in C, using functions, arrays, pointers and structures.

CO 3. Apply the concepts of Stacks and Queues in solving the problems.

CO 4. Explore various operations on Linked lists.

CO5. Demonstrate various tree traversals and graph traversal techniques.

**UNIT-1**

**Introduction to C Language** - C language elements, structure of C program ,A simple C program, variable declarations and data types, operators and expressions, decision statements - If and switch statements, loop control statements - while, for ,do-while statements, arrays, control statements-break and continue, programming examples.

**UNIT – 2**

**Functions**: Defining a function, Accessing a function, Function prototypes, Passing arguments to a function, Parameter passing mechanisms - Call-by-value, Call-by-reference, Recursion, Storage classes (auto, static, register, extern),**Arrays**: Declaration and Definition of an array, Processing an Array, Passing arrays to functions, Two dimensional and Multi-dimensional arrays**, Strings:** Defining and Initialization of Strings, NULL character, Reading and Writing a string , Processing the string , String handling functions.

**UNIT-3**

**Pointers:** Fundamentals, Pointer declarations, Pointers and One-dimensional array, Dynamic memory allocation, Operations on pointers**, Structures and Unions**: Declaration, Definition and Initialization of structures, Accessing structures, User defined data type (typedef), Enumerated Data types, Nested structures, Array of structures, Structures and pointers, Passing structures to functions, Unions.

**UNIT – 4**

**Data Structures**

Overview of data structures, stacks and queues, representation of a stack, operations on a stack, implementation of a stack, evaluation of arithmetic expressions, infix, prefix, and postfix notations, evaluation of postfix expression, conversion of expression from infix to postfix, recursion, queues - various positions of queue, representation of queue, insertion, deletion, searching operations.

**Linked Lists** – Singly linked list, dynamically linked stacks and queues, polynomials using singly linked lists, using circularly linked lists, insertion, deletion and searching operations, doubly linked lists and its operations, circular linked lists and its operations.

**UNIT-5**

**Trees** - Tree terminology, Binary trees, representation, binary tree traversals. Binary tree operations, Graphs - graph terminology, graph representation, elementary graph operations, Breadth First Search (BFS) and Depth First Search (DFS), connected components, spanning trees.

**Searching and Sorting** – sequential search, binary search, exchange (bubble) sort, selection sort, Insertion sort.

**TEXT BOOKS:**

1. Behrouz A. Forouzan, Richard F. Gilberg, ―C Programming & Data Structures‖, India Edition, Course Technology, 2010.
2. The C Programming Language, Brian W Kernighan and Dennis M Ritchie, Second Edition,Prentice Hall Publication.
3. Fundamentals of Data Structures in C, Ellis Horowitz, SartajSahni, Susan Anderson-Freed,Computer Science Press.
4. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. AnandaRao,Pearson Education.
5. B.A. Forouzon and R.F. Gilberg, "COMPUTER SCIENCE: A Structured Programming Approach Using C", Third edition, CENGAGE Learning, 2016.
6. Richard F. Gilberg & Behrouz A. Forouzan, "Data Structures: A Pseudocode Approach withC", Second Edition, CENGAGE Learning, 2011.

**Reference Books:**

1. Pradip Dey and Manas Ghosh, Programming in C, Oxford University Press, 2nd Edition2011.
2. E. Balaguruswamy, "C and Data Structures", 4th Edition, Tata Mc Graw Hill.
3. A.K. Sharma, Computer Fundamentals and Programming in C, 2nd Edition, UniversityPress.
4. M.T. Somashekara, "Problem Solving Using C", PHI, 2nd Edition 2009.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 3 | | | | | | | 1 | | 2 | | 1 | |
| CO2 | 2 | 2 | | | | | | | | | 2 | | | 2 |
| CO3 | 2 | 2 | | | | | | | | | | | 1 | |
| CO4 | 2 | 3 | | 2 | | | | | | | 2 | | | 1 |
| CO5 | 3 | 3 | | 2 | | | | | | | 2 | | | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
# (AUTONOMOUS)

**I B.Tech I Semester (Common to EEE, CSE, IT, CSE(DS) & CSE(AI & ML))**
**I B.Tech II Semester (Common to CE, ME & ECE)**

| L | T | P | C |
|---|---|---|---|
| 1 | 0 | 4 | 3 |

## 20AME01 COMPUTER AIDED ENGINEERING DRAWING

### COURSE OUTCOMES:

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

**CO1:** Communicate his/her ideas effectively by using AutoCAD software.

**CO2:** Project the points, lines, planes, solids with digital environment

**CO3:** Represent sectional views of solids and develop the sectioned object surfaces.

**CO4:** Communicate his/her ideas effectively by using Orthographic Projections and Isometric Viewsusing computer software.

INTRODUCTION:

1. Information about sketch book and allotment of marks for both sketching and computer executionwork.
2. AutoCAD commands and use of limits, units and dimensioning the views on computer.
3. Orthographic projections - Principles of projection – both first and third angle and symbols.
4. Practicing on computer (first classes).
5. All the problems are to be solved on the sketch book and after it is checked by theinstructor, it should be executed on the computer.

THEORY:

**UNIT I**

Geometrical constructions – construction of polygons (inscribing, circumscribing), special methods– circle-tangents, Conics-ellipse, parabola, hyperbola -properties of conics, specialmethods of construction.

UNIT II

Projections of points – Projections of straight lines- lines inclined to both the principal planes, determination of true length, traces and true inclinations.

UNIT III

Projections of planes – inclined to both the principal planes.

Projection of regular solids – prisms, Pyramids, cylinders, tetrahedron and cones – axis inclined to oneplane.

UNIT IV

Sections of solids such as prisms, pyramids, cylinders, tetrahedron and cones (solids in simple position) – True shape of the section.Development of surfaces of simple solids, as above and part solids.

UNIT V

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

Practice:

**1. Geometrical constructions:**

a) Sketching of polygons - Triangles, Square, Rectangle, Pentagon, Hexagon, Circle at different positions.
b) Sketching of Tangents to the circles.

**2.** Conics:

Constructions of Ellipse, Parabola, Hyperbola

**3.** Points:

Drawing the quadrants and positioning of the points with reference to H.P and V.P with dimensions.

**4.** Lines:

a) Sketching of lines when they are
   i. Parallel to both H.P & V.P
   ii. Parallel to V.P/H.P and perpendicular to H.P /V.P
   iii. Parallel to V.P/H.P and inclined to H.P /V.P
   iv. Inclined to both the planes
b) Sketching of the line to measure true length & true inclinations
c) Sketching of the line to determine the traces

**5.** Planes:

Sketching of the planes when they are

a) Perpendicular to V.P/H.P and parallel to H.P /V.P
b) Inclined to V.P/H.P and perpendicular to H.P /V.P
c) Perpendicular to both V.P and H.P.
d) Inclined to both V.P and H.P.

**6.** Solids:

a) Sketching of 2D shapes and convert it to 3D solids (Prisms, Pyramids, cube, cylinder, one, tetrahedron)
b) Sketching of projections of solids when the position of axis is
   i. Perpendicular to V.P/H.P and parallel to H.P /V.P.
   ii. Inclined to V.P/H.P and parallel to H.P /V.P.
   iii. Parallel to both V.P and H.P.

**7.** Sections of solids:

a) Different types of hatching on the polygons.
b) Sketching of sections of solids when the section/cutting plane is
   i. Parallel to V.P/H.P and perpendicular to H.P /V.P.
   ii. Inclined to V.P/H.P and perpendicular to H.P /V.P.
   iii. Perpendicular to both principal planes.
c) Sketching of sections when the cutting plane passing through different positions- base, axis, corner, apex/vertex, generator, lateral edge.
d) Sketching of true shapes.

**8.** Development of surfaces:

Sketching of developed surfaces of

a) cylinder, prisms using parallel line method

b) cone, pyramids using radial line method
c) truncated solids and frustum

**9.** Orthographic Projections:

Sketching of 2D views of front, top and side views of 3D objects.

**10.** Isometric projections:

a) Setting of isometric grid
b) Sketching of isometric views of 3D models / shapes.

TEXT BOOKS:


1. K. L. Narayana and S. Bheemanjaneyulu, Engineering Drawing with AutoCAD 2016, New AgePublishers, New Delhi, 2017.
2. Basant Agrawal and C.M.Agrawal, Engineering Drawing, Mc Graw Hill Education 2nd edition.


REFERENCE BOOKS:


1. K.Venugopal, Engineering Drawing and Graphics + AutoCad , New Age International (P)Ltd,Publishers, New Delhi, Fourth Edition
2. Siddiquee Arshad. N., Zahid A. Khan, Mukhtar Ahmad, Engineering Drawing: With primer onAUTOCAD, PHI Learning Pvt. Ltd.,


| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PS01 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 1 | | 1 | | 2 | | | | | 2 | | 2 | **1** | |
| **CO2** | 1 | | 2 | | 2 | | | | | | | 2 | | **2** |
| **CO3** | 1 | | 2 | | 2 | | | | | | | 2 | **1** | |
| **CO4** | 1 | 2 | 2 | | 3 | 2 | 2 | 1 | 2 | | | 3 | | **1** |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**I B.Tech I Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML))**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

## 20ACS02 COMPUTATIONAL THINKING

**Course Outcomes:**
After completion of this course, the student will be able to:
1. Understand the computational thinking and moore's law.
2. Understand the Boolean logic and applications of propositional logic.
3. Learn actions and data organization.
4. Understand software correction, testing and performance measure using computer.

**UNIT –I**
Computer, computer science and computational thinking, From Abacus to machine, the first software , what make it a modern computer first computer,moores law, **How Real world data becomes computable Data:** Information and data, converting information to data, capacity, Data types and Data Encoding, Data Compression, **Logic:** what is logic, Boolean logic-writing well-formed propositions, Evaluating propositions, Applications of propositional Logic

**UNIT- II**
**Solving Problems:** problem definition, Logic Reasoning, software design, other issues, Abstraction-Class diagram, use case diagram, **Algorithm thinking:** algorithm, software and programming language, Actions-Selection, Repetition, modularization.

**UNIT- III**
**Modeling Solutions-** Activity Diagrams, Selection in Activity Diagram, Repetition in Activity Diagram, States and state diagrams, Including Behavior in state diagram, Data organization: Names, List-Arrays, linking, Graphs, And Hierarchies-organization charts, family tree, Biology, Linguistics, Trees.

**UNIT- IV**
von Neumann Architecture, Spread sheets-Spread sheet structure, Formulas/Expressions,, Text Processing-string basics, string operation, Patterns-how to write a pattern, Repetitions rules, character class rules

**UNIT -V**

Computer errors, software corrections, verification, software testing , white box testing ,black box testing, boundary value analysis **,** How is capacity measured in computer, an estimate of physical limitation , benchmarks, counting the performance, impractical algorithm ,impossible algorithms

**Text Books:**

1. Computational thinking for modern solver, David Riley and Kenny Hunt Chapman & Hall/CRC, 2014

**Reference Books:**

1. How to solve it by Computer, R.G. Dromey, PHI, 2008

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 3 | | | | | | | 1 | | 2 | | 1 | |
| CO2 | 2 | 2 | | | | | | | | | 2 | | | 2 |
| CO3 | 2 | 2 | | | | | | | | | | | 1 | |
| CO4 | 2 | 3 | | 2 | | | | | | | 2 | | | 1 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**I B.Tech I Semester (Common to EEE, CSE, IT, CSE (DS) & CSE (AI&ML)**

**I B.Tech II Semester (Common to CE, ME, ECE, CAI, CSC & CSO)**

| L | T | P | C |
|---|---|---|---|
| 0 | 0 | 3 | 1.5 |

**20AHS07 ENGINEERING PHYSICS LAB**

**Course Outcomes:**

After completion of practical, student will be able to

CO 1. Explore the knowledge of Spectrometer and other optical instruments.

CO 2. Apply concepts of magnetic materials, lasers, semiconductor, and it's their relative parameters.

CO 3. Access, process and analyze scientific information of optical communication.

**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.
3. Determine the thickness of thin wire by Interference.
4. Determine the wavelength of given laser source - Diffraction grating.
5. Determine the radius of curvature of given piano convex lens by forming Newton Rings.
6. Magnetic field along the axis of a current carrying coll - Stewart and Gee's method.
7. Numerical Aperture of an optical fiber.
8. Bending losses In Optical Fiber.
9. Determine the wavelength of Laser source using optical fiber.
10. Determine Hall Coefficient and Carrier concentration of the given Semiconductor.
11. Determine the energy loss of ferromagnetic sample by plotting B-H curve.
12. Energy gap of a given semiconductor.
13. Solar Cell: To study the V-I Characteristics of solar cell.
14. Determine the particle size using laser source.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 1 | - | - | - | - | - | - | - | - | - | - | 2 | - |
| **CO2** | 3 | 1 | - | - | 2 | - | - | - | - | - | - | - | - | 2 |
| **CO3** | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**I B.Tech I Semester (Common to all branches)**

| L | T | P | C |
|---|---|---|---|
| 0 | 0 | 3 | 1.5 |

## 20ACS03 C PROGRAMMING & DATA STURCTURES LAB

### Course Outcomes

After completion of the course the student will be able to

1. Demonstrate basic concepts of C programming language.
2. Develop C programs using functions, arrays, structures and pointers.
3. Illustrate the concepts Stacks and Queues.
4. Design operations on Linked lists.
5. Develop searching and sorting methods.

**Week l**

a) Programs using I/O statements and expressions.

b) Programs using decision-making constructs.

**Week 2**

Write C programs that use both recursive and non-recursive functions

i) To find the factorial of a given integer.

ii) To solve Towers of Hanoi problem.

**Week 3**

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 4**

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) Given a string ―a$bcd./fg‖ find its reverse without changing the position of special characters. (Example input:a@gh%;j and output:j@hg%;a)

**Week 5**

From a given paragraph perform the following using built-in functions:

a. Find the total number of words.

b. Capitalize the first word of each sentence.

c. Replace a given word with another word.

**Week 6**

a) Write a C Program to perform various arithmetic operations on pointer variables.

b) Write a C Program to demonstrate the following parameter passing mechanisms:

i) call-by-value ii) call-by-reference

**Week 7**

Write C programs that implement stack (its operations) using

i) Arrays

ii) Pointers

**Week 8**

Write C programs that implement Queue (its operations) using

i) Arrays

ii) Pointers

**Week 9**

Write a C program that uses Stack operations to perform the following:

i) Converting infix expression into postfix expression

ii) Evaluating the postfix expression

**Week 10**

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 11**

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 12**

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 13**

Write a C program that uses functions to perform the following:

i) Creating a Binary Tree of integers

ii) Traversing the above binary tree in preorder, inorder and postorder.

**Week 14**
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 15**
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 16 (Case Study)**
Create a —Railway reservation system‖ with the following modules

i) Booking
ii) Availability checking
iii) Cancellation
iv) Prepare chart

**Text Books:**

1. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. Ananda Rao, Pearson Education.
2. B.A. Forouzon and R.F. Gilberg, "COMPUTER SCIENCE: A Structured Programming Approach Using C", Third edition, CENGAGE Learning, 2016.
3. Richard F. Gilberg & Behrouz A. Forouzan, "Data Structures: A Pseudocode Approach with C", Second Edition, CENGAGE Learning, 2011.

**Reference Books:**

1. PradipDey and ManasGhosh, Programming in C, Oxford University Press, 2nd Edition 2011.
2. E.Balaguruswamy, "C and Data Structures", 4th Edition, Tata Mc Graw Hill.
3. A.K.Sharma, Computer Fundamentals and Programming in C, 2nd Edition, University Press.
4. M.T.Somashekara, "Problem Solving Using C", PHI, 2nd Edition 2009.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | | | | | | | 1 | | 2 | | 1 | |
| CO2 | 2 | 2 | | | | | | | | | | | | 2 |
| CO3 | 2 | 2 | | | | | | | | | | | 1 | |
| CO4 | 3 | 3 | | 2 | | | | | | | 2 | | | 1 |
| CO5 | 3 | 3 | | 2 | | | | | | | 2 | | | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

**I B.Tech I Semester (Common to EEE, CSE, CSE (DS), CSE (AI & ML) & IT)I B.Tech II Semester (Common to CE, ME & ECE)**

| L | T | P | C |
|---|---|---|---|
| 2 | 0 | 0 | 0 |

**20AHS09 ENVIRONMENTAL SCIENCES**

(Mandatory Course)

**Course Outcomes**:

After completion of practical, student will be able to

1. Understand what constitutes the environment, how to conserve the precious resources and maintainthe ecological balance.
2. Aware of maintain the ecological balance based on the cultural and biological diversity can realizethe importance of ecosystem, biodiversity and its conservation.
3. Identify the major pollutants and abatement devices in order to protect the environment frompollution for effective environmental management.
4. Manage social issues related to the environment and be aware of the enforcement of environmentacts in our constitution.

## UNIT I

**ECO SYSTEMS AND BIODIVERSITY AND ITS CONSERVATION:**

Definition, scope and importance, Need for public awareness. Concept of an ecosystem - Structure and function of an ecosystem.- Producers, consumers, decomposers - Energy flow in the eco systems - Ecological succession - Food chains, food webs and ecological pyramids -Introduction, types, characteristic features, structure and function of the following eco systems: - Forest ecosystem - Grass land ecosystem - Desert ecosystem - Aquatic eco systems (lakes, rivers, oceans) – Introduction - Definition: genetics, species and ecosystem diversity - Biogeographical classification of India. - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - India as a mega diversity nation - Hot-spots of biodiversity. - Threats to biodiversity: habitats loss, poaching of wild life, man wildlife conflicts- Endangered and endemic species of India- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

## UNIT II

**NATURAL RESOURCES:**

a) Forest resources- Use and over-exploitation – deforestation - case studies - Timber extraction – mining- dams and their effects on forests and tribal people. - Water resources - Use and over-utilization of surface and ground water - floods, drought - conflicts over water - dam’s benefits and problems. - Mineral

Resources - Use and exploitation - environmental effects of extracting and using mineral resources - case studies - Food Resources - World food problems - effects of modern agriculture - fertilizers- pesticides problems - Energy Resources - Growing energy needs- renewable and non- renewable energy sources, use of alternate energy sources - case studies.

b) Role of an individual in conservation of natural resources.

c) Equitable use of resources for sustainable life styles.

**UNIT III**

**ENVIRONMENTAL POLLUTION:**

Definition Causes, effects and control measures of: a. Air pollution b. Water pollution c. Soil pollution

d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards - Solid waste Management: - Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution - Pollution case studies - Disaster management: Floods, earth quake, cyclone and landslides.

**UNIT IV**

**SOCIAL ISSUES AND THE ENVIRONMENT:**

Form unsustainable to sustainable development - Urban problems related to energy - Water conservation, rain water harvesting, water shed management - Resettlement and rehabilitation of people; its problems and concerns, case studies - Environmental ethics: issues and possible solutions - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies - Wasteland reclamation - Consumerism and waste products - Environment protection Act - Air (prevention and control of pollution) Act - Water (prevention and control of pollution) Act - Wildlife protection act - Forest conservation act - Issues involved in enforcement of environmental legislations - Public awareness. Visit to a local area to document environment assets river / forest / grassland / hill / mountain.

**UNIT V**

**HUMAN POPULATION AND THE ENVIRONMENT:**

Population growth and variation among nations - Population explosion- family welfare program - Environment and human health - Human rights - Value education - HIV / AIDS

-Women and child welfare

- Role of information technology in environment and human health - Case studies. Visit to a local polluted site-urban/rural/industrial/agricultural. Study of common plants, insects, birds. Study of simple ecosystems-pond, river, hills lopes, etc

**Text Books:**

1. Textbook of Environmental studies, Erach Bharucha, UGC.
2. Fundamental concepts in Environmental Studies, D D Mishra, , S Chand & Co Ltd

**References Books:**

1. Environmental Science G. Tyler Miller and Scottt Spoolman, Cengage Learning Publishers, 15lhEdition, 2015.
2. Environmental Encyclopedia Cunningham, W. P, Cooper T.H, Gorhani, Jaico publications,Mumbai, 2001.
3. Environmental Chemistry, B.K.Sharma, Krishna Prakashan Media ( p) Ltd, 2011.

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PS01 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | - | - | - | - | 1 | - | - | - | 2 | |
| CO2 | 3 | 1 | - | - | - | - | - | - | 1 | - | - | - | 2 | 3 |
| CO3 | 3 | 2 | - | - | - | - | - | - | 2 | - | - | - | 1 | |
| CO4 | 2 | 2 | - | - | - | - | - | - | 2 | 1 | - | - | | 2 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)**

**I B. Tech I Semester (Common to CE, ME, ECE, CAI, CSC & CSO)**
**I B. Tech II Semester (Common to EEE, CSE, IT, CSE (DS) & CSE (AI & ML)**

| L | P | T | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

**20AHS01 COMMUNICATIVE ENGLISH**

**Course Outcomes:**

After successful completion of this course, the students will be able to:

**CO1:** Develop knowledge of basic grammatical concepts to understand asking and answering general questions on familiar topics and making paragraphs.

**CO2:** Interpret context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English

**CO3:** Examine language aspects to do role plays, to study graphic elements and information transfer.

**CO4:** Demonstrate discourse markers to make effective oral presentations and to write structured essays.

**UNIT I: EXPLORATION**

**LESSON: A proposal to Girdle the Earth, Nellie Bly.**

**LISTENING**: Identifying the topic, the context and specific pieces of information by listening to short audio texts and answering a series of questions.

**SPEAKING:** Asking and answering general questions on familiar topics such as home, family, work, studies and interests; introducing oneself and others.

**READING:** Skimming to get the main idea of a text; scanning to look for specific pieces of information.

**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:** Content words and function words; word forms: verbs, nouns, adjectives and adverbs; nouns: countable and uncountable; singular and plural; basic sentence structures; simple question form - wh-questions; word order in sentence.

**UNIT II: ON CAMPUS**

**LESSON: The District School As It Was by One Who Went It, Warren Burdon**

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

**SPEAKING:** Discussion in pairs/ small groups on specific topics followed by short structured talks.

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

**WRITING:** Paragraph writing (specific topics) 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.

**UNIT III: WORKING TOGETHER**

**LESSON: The Future of Work**

**LISTENING:** Listening for global comprehension and summarizing.

**SPEAKING:** Discussing specific topics in pairs or small groups and reporting.

**READING**: Reading a text in detail by making basic inferences -recognizing and interpreting specific context clues; strategies to use text clues for comprehension.

**WRITING:** Summarizing - identifying main idea/s and rephrasing what is read; avoiding redundancies and repetition

**GRAMMAR AND VOCABULARY:** Verbs - tenses; subject-verb agreement; direct and indirect speech, reporting verbs for academic purposes.

**UNIT IV: FABRIC OF CHANGE**

**LESSON: H.G. Wells and the Uncertainties of progress, Peter J. Bowler.**

**LISTENING:** Making predictions while listening to conversations/ transactional dialogues without video; listening with video.

**SPEAKING:** Role plays for practice of conversational English in academic contexts (formal and informal) - asking for and giving information/direction.

**READING**: Studying the use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicate processes or display complicated data.

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

**GRAMMAR AND VOCABULARY:** Quantifying expressions - adjectives and adverbs; comparing and contrasting; degrees of comparison; use of antonyms

**UNIT V: TOOLS FOR LIFE**

**LESSON: Leaves from the Mental Portfolio of a Eurasian, Sui San Far.**

**LISTENING**: Identifying key terms, understanding concepts and answering a series of relevant questions that test comprehension.

**SPEAKING**: Formal oral presentations on topics from academic contexts - without the use of PPT slides.

**READING:** Reading for comprehension.

**WRITING:** Writing structured essays on specific topics using suitable claims and evidences

**GRAMMAR AND VOCABULARY**: Editing short texts –identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject verb agreement)

**Text Books**

1. English all round: Communication Skills for under graduation LearnersVol. I,Orient Black Swan Publishers, First Edition2019.

**Reference Books**

1. Academic writing: A handbook for international students, Bailey, Stephen, Routledge.2014.
2. Pathways: Listening, Speaking and Critical Thinking Chase. BeckyTarver, HeinleyELT; 2nd Edition, 2018.
3. Skillful Level 2 Reading & Writing Student's Book Pack (B1) MacmillanEducational

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | - | - | - | - | - | - | - | - | 3 | - | - | 1 | 2 |
| **CO2** | 2 | 2 | - | - | - | - | - | - | - | 3 | - | - | - | - |
| **CO3** | 3 | 3 | - | - | - | - | - | - | - | 3 | - | - | 2 | 2 |
| **CO4** | 3 | - | - | - | - | - | - | - | 3 | 3 | - | - | - | 2 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**(AUTONOMOUS)**

**I B.Tech I Semester (Common to CE, ME, ECE, CAI, CSC & CSO)**
**I B.Tech II Semester (Common to EEE, CSE, IT, CSE (DS) & CSE (AI &ML))**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

**20AHS03 ENGINEERING CHEMISTRY**

## Course Outcomes:

After completion of the course students will be able to

1. Understand the impact of hard water and its removal, apply the concept of estimation of hardness.
2. Analyse the selection of suitable engineering materials for specific applications.
3. Understand the Effect of corrosion and to know the designing of corrosion resistant articles.
4. Apply suitable fuels based on analysis of coal, calorific value for a particular application, calculation of air requirements for combustion of fuel, types of various batteries.

**UNIT – I**

**WATER TECHNOLOGY:** Sources of water - impurities in water - Hardness of Water and its unit of expression - Estimation of hardness in water by EDTA titration method - Numerical problems - Boiler troubles and prevention methods - Estimation of Dissolved Oxygen in water by Winkler's method - specifications for drinking water Bureau of Indian Standards(BIS) and World health organization(WHO) standards - Water softening methods by Internal conditioning and External conditioning methods - Chlorination Of Domestic Water Treatment - Desalination of Brackish Water by Reverse Osmosis and electro dialysis methods.

**UNIT – II**

**MATERIALS CHEMISTRY: High Polymers:** Polymers – Definition - Nomenclature of polymers - Types of polymerization reactions addition, condensation and copolymerization with examples. Plastics: Thermoplastics and thermosetting plastics and differences between them - Preparation, Properties and Engineering applications of PE, PTFE, PVC, Nylon and Bakelite. Conducting polymers - polyacetylene, polyaniline, polypyrroles - mechanism of conduction and applications. **Rubbers:** Natural Rubbers – Vulcanization - Synthetic Rubbers (Buna-S, Silicone Rubber, Neoprene) preparation, properties and applications. **Lubricants:** Functions of Lubricants - Classification of Lubricants - various properties of Lubricants (Viscosity, Viscosity Index, Flash and fire point, Cloud and pour point, Aniline point, Acid value or Neutralization number. **Refractories**: Important properties of refractories (Refractoriness, Refractoriness under Load, Porosity, Thermal spalling) and their applications.

**UNIT – III**

**CHEMISTRY OF CORROSION:** Introduction on corrosion - causes and consequences of corrosion - Types of corrosion - Dry, Wet, Galvanic, Differential Corrosion - Mechanism of Dry and Wet corrosion - Factors influencing the corrosion - Control of corrosion - Cathodic protection by Sacrificial anodic and Impressed current cathodic protection - Electro Plating and Electroless plating (Copper and Nickel).

**UNIT – IV**

**FUELS AND COMBUSTION:** Fuels, Classification of Solid, Liquid and Gaseous fuels - Analysis of coal - Proximate and Ultimate analysis - Refining of Petroleum - Preparation of synthetic petrol - Bergius process - knocking and anti-knock agents - Octane and Cetane values - Calorific value - HCV, LCV - Numerical problems using Dulong-Petit's formula - Measurement of calorific value using Bomb calorimeter and Junkers gas calorimeter - Numerical problems.

**Combustion:** Calculation of air quantity requirement for Combustion - Numerical problems.

**UNIT–V**

**ELECTROCHEMICAL ENERGY SYSTEMS:** Electrochemical Cells - Electrode potential - Standard electrode potential - Nernst equation - cell potential calculations - Basic concepts of pHmetry, Potentiometry and Conductometric Titrations - Working principles and applications of different batteries - Dry cell, Lithium-ion cell, Lead-acid cell and Nickel-cadmium cell with discharging and recharging reactions - Working principles and applications of hydrogen-oxygen fuel cell, methanol-oxygen fuel cell.

## Text Books:

1. A text book of Engineering Chemistry, Jain & Jain, Dhanpat Rai Publishing Company, 15$^{th}$ edition, New Delhi, 2008.
2. Chemistry for Engineers, Prof. K.N.Jayaveera, Dr.G.V.Subba Reddy and Dr.C. Ramachandraiah, McGraw Hill Higher Education Hyd., 3$^{rd}$ edition, 2009.

## Reference Books:

1. Engineering Chemistry, Dr. K. B. Chandrasekhar, Dr. U.N. Dash, Dr. Sujatha Mishra, Scitech Publications (India) Pvt. Limited, Hyderabad, 2009.
2. A text book of Engineering Chemistry, Dr. K. RaviKrishnan, Sri Krishna Publications, Secunderabad, Telangana, New edition. July, 2015.
3. Chemistry of Engineering Materials, C.V. Agarwal, C. Parameswara Murthy and Andra Naidu, BS Publications, Hyderabad, 9th edition, 2006.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 1 | - | - | - | - | - | - | - | - | - | - | 2 | - |
| CO2 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| CO4 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | - |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**I B.Tech II Semester (Common to All Branches)**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 3 |

### 20AHS08 ALGEBRA AND TRANSFORMATION TECHNIQUES

**Course Outcomes:**

After completion of the course the student will be able to

1. Solving system of linear equations and determine the eigen values and eigen vectors.
2. Apply the knowledge of Laplace and Fourier transform Techniniques in solving differential equations.
3. Apply Fourier series to expand given functions.
4. Analyze the principles of Z-transforms for solving the difference equation.

**UNIT-I**

**MATRICES**: Rank of a matrix by echelon form, normal form. Solving system of homogeneous and non-homogeneous linear equations. Eigen values and Eigen vectors. Cayley- Hamilton theorem (without proof) – Finding inverse and power of a matrix by Cayley-Hamilton theorem. Diagonalization of a matrix.

**UNIT-II**

**LAPLACE TRANSFORMS**: Laplace transforms of standard functions - First Shifting Theorem -Transforms of derivatives and integrals- Unit step Function – Second Shifting Theorem –Laplace transforms of Periodic functions – Inverse Laplace transforms - Convolution theorem. Applications of Laplace Transforms to ODE

**UNIT-III**

**FOURIER SERIES:** Determination of Fourier coefficients- Fourier series- Even and odd functions -Fourier series in an arbitrary interval -Half-range Fourier sine and cosine expansions.

**UNIT-IV**

**FOURIER TRANSFORMS**: Fourier integral theorem (only statement) - Fourier sine and cosine integrals. Fourier Transforms - Fourier sine and cosine Transforms – properties –Inverse transforms – Infinite Fourier transforms.

**UNIT-V**

**Z-TRANSFORMS:** Standard functions - Properties - Damping rule- Shifting rule - Initial and final value theorems. Inverse Z- transforms - Convolution theorem - Solution of difference equations by Z- transforms.

**Text Books:**

1. Higher Engineering Mathematics, Dr. B. S. Grewal, 44/e Kanna Publications, 2017.
2. A Text book of Engineering Mathematics –II, T. K. V. Iyengar, B. Krishna Gandhi and others, S. Chand and company. 8th Revised edition, 2013.

**Reference Books:**

1. A Text Book of Engineering Mathematics-I, B.V. Ramana, , Tata Mc Grawhill
2. Advanced Engineering Mathematics, Erwin Kreyszig, John Wiley & Sons-2016.
3. Introductory Methods of Numerical Analysis S.S. Sastry, Printice Hall of India publications, 2012.

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | 1 |
| **CO2** | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| **CO3** | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | 1 | - |
| **CO4** | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | 1 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(AUTONOMOUS)**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 3 |

**I B. Tech II Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML)**

**20AEE05 BASIC ELECTRICAL ENGINEERING**

**Course Outcomes:**

After completion of this course the students will be able to:

1. Evaluate the electrical circuits and networks parameters
2. Emphasis the RLC Design models
3. Acquire the concept of all types of Electrical DC Machines and AC Machines
4. To know the concept of all types of Electrical systems

**UNIT I: DC CIRCUITS & AC CIRCUITS**

**DC Circuits:**

Electrical circuit elements (R - L and C) – Kirchhoff's laws -Voltage and Current division rules series, parallel circuits and star-delta and delta-star transformations

**AC Circuits:**

Generation of sinusoidal voltage, Representation of sinusoidal waveforms - Peak and RMS values - phasor representation – real power - reactive power - apparent power -, energy and power factor.

**UNIT II: DC MACHINES**

**DC Generator:**

Construction-Principle and operation of DC Generator - EMF equation -Types– Applications

**DC Motor**:

Principle and operation of DC Motor – types-Torque equation - Speed control of DC Motor-Brake test- Swinburne's test-Applications.

**UNIT III: AC MACHINES I**

**Transformers:** Construction and working of a single-phase transformer, EMF Equation; Construction andworking of three phase Induction motor, torque equation, torque-slip characteristics, Applications;

**UNIT IV: AC MACHINES II**

Construction and working of synchronous machines, Applications. Construction and working of Stepper, Universal motor, Brushless DC Motor. Resistor start, capacitor start and run single phase induction motors, Applications

**UNIT V: PRINCIPLES OF ELECTRICAL SYSTEMS**

Fuse, circuit breaker (MCB, MCCB, RCCB, ELCB), relay (elementary treatment); Inverter and UPS (block diagram approach only). Earthing – importance of earthing, pipe earthing and plate earthing; Safety measures. Energy Efficiency (Starrating) standards by BEE.

**Text books:**

1. V.K.Mehta & Rohit Mehta, Principles of Electrical Engineering, S.Chand publications
2. D.P. Kothari and I.J. Nagarath –“Basic Electrical & Electronics Engineering”, Mc.Grawhill publications
3. Ashfaq Hussain, Fundamentals of Electrical Engineering, Dhanpatrai & Co. (P)Ltd., 3rd edition, New Delhi, 2009.

**Reference Books:**

1. Cotton, Electrical Technology, CBS Publishers & Distributors, 2004.
2. T.K.Naga sarkar, M.S.Sukhija, Basic Electrical Engineering, Oxford University press New Delhi, 2010
3. M.S. Naidu, S. Kamakshaiah, Introduction to Electrical Engineering, Tata McGraw-Hill Education, New Delhi, 2007.

**-**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PS02 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 2 | | | 3 | | | 1 | | | 1 | | 1 | |
| CO2 | 1 | 2 | | | 3 | | | 1 | | | | | | |
| CO3 | 1 | | | | 2 | | | 1 | | | | | | |
| CO4 | 1 | 1 | | | 1 | | | 2 | | | 1 | | | 2 |

## Sri Venkateswara College of Engineering and Technology
## (Autonomous)

**I B.Tech II Semester** (Common to all branches)

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 3 |

**20ACS04 PROBLEM SOLVING AND PROGRAMMING USING PYTHON**

### Course Outcomes:

After Completion of the course the student will be able to

1. Demonstrate knowledge in Basics of python programming
2. Use the data structure lists, Dictionaries and Tuples.
3. Solve the problems by applying the modularity principle.
4. Demonstrate knowledge in OOP.
5. Demonstrate various mathematical operations using NumPy, Analyze Data using Pandas and visualizations using Matplotlib.

### UNIT- I

### INTRODUCTION TO PROBLEM SOLVING, EXPRESSION AND DATA TYPES

**Fundamentals:** what is computer science - Computer Algorithms - Computer Hardware - Computer software - Computational problem solving the Python programming language - Overview of Python, Environmental Setup, First program in Python, Python I/O Statement. **Expressions and Data Types:** Literals, Identifiers and Variables, Operators, Expressions. Data types, Numbers, Type Conversion, Random Number.

**Problem solving:** Restaurant Tab calculation and Age in seconds.

### UNIT- II

### CONTROL STRUCTURES& COLLECTIONS

**Control Structures:** Boolean expressions, Selection control and Iterative control. **Arrays -** Creation, Behavior of Arrays, Operations on Arrays, Built-In Methods of Arrays.**List** –Creation, Behavior of Lists, Operations on Lists, Built-In Methods of Lists. **Tuple** -Creation, Behavior of Tuples, Operations on Tuples, Built-In Methods of Tuples. **Dictionary** – Creation, Behavior of Dictionary, Operations on Dictionary, Built-In Methods of Dictionary. **Sets** – Creation, Behavior of Sets, Operations on Sets, Built-In Methods of Sets, Frozen set.

**Problem Solving:** A Food Co-op’s Worker Scheduling Simulation.

## UNIT- III

## STRINGS, FUNCTIONS AND FILES

**Strings -** String Literal, Assigning String to a variable, Multiline Strings, String Slicing, Built-in Functions and Methods. **Functions** – Creating functions, calling a function, passing arguments to functions, function with return statement, Recursive function, Lambda Function**. Files** – File Handling, Create, Write, Read and Delete Files

## UNIT-IV

## OBJECT ORIENTED PROGRAMMING AND EXCEPTIONS

**OOP** - Classes and Objects, Encapsulation, Inheritance, Polymorphism, Constructor and Destructor, Self parameter, Local and Global Scope, Access Modifiers, Polymorphism, super() method. Modules in python. **Exceptions** – Handling Exceptions, Raising Exceptions, Exception Chaining, User Defined Exceptions.

**Problem solving**: Credit card calculation.

## UNIT- V

**INTRODUCTION TO NUMPY, PANDAS, MATPLOTLIB**: Exploratory Data Analysis (EDA), Data Science life cycle, Descriptive Statistics, Basic tools (plots, graphs and summary statistics) of EDA, Philosophy of EDA. Data Visualization: Scatter plot, bar chart, histogram, boxplot, heat maps, etc.

## Text Books:

1. Introduction to Computer Science using Python: A Computational Problem-Solving Focus, First Edition,Charles Dierbach, Wiley India , 2012.
2. Programming Python,Mark Lutz, O'Reilly Publications, Fourth Edition, 2011.

## Reference Books:

1. Core Python Programming, 2 nd edition,R. Nageswara Rao, Dreamtech Press, 2018.
2. Fundamentals of Python,, Third Edition,Kenneth Lambert and B.L. Juneja,Cengage Learning, 2012.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | | | | | | | 1 | | 2 | | 1 | |
| CO2 | 2 | 2 | | | | | | | | | | | | 2 |
| CO3 | 2 | 2 | | | | | | | | | | | 1 | |
| CO4 | 3 | 3 | | 2 | | | | | | | 2 | | | 1 |
| CO5 | 3 | 3 | | 2 | | | | | | | 2 | | | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

**I B.Tech I Semester (Common to CE, ME, ECE, CSD, CSE & CSM)**
**I B.Tech II Semester (Common to EEE, CSE, IT, CSE(DS)&CSE(AI &ML))**

| L | T | P | C |
|---|---|---|---|
| 0 | 0 | 3 | 1.5 |

**20AHS05 COMMUNICATIVE ENGLISH LAB**

## Course Outcomes:

After completion of the course students will be able to

1. Remember and understand the different aspects of the English language proficiency with emphasis on LSRW skills
2. Develop communication skills through debates, oral presentations, group discussions and various language learning activities
3. Analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and reading comprehension.
4. Evaluate and exhibit acceptable etiquette essential in social and professional settings.

**UNIT I**

1. Phonetics for listening comprehension of various accents.
2. Reading comprehension
3. Describing objects/places/persons

**UNIT II**

1. JAM
2. Small talks on general topics
3. Debates

**UNIT III**

1. Situational dialogues – Greeting and Introduction
2. Summarizing and Note making
3. Group Discussion

**UNIT IV**

1. Asking for Information and Giving Directions
2. Information Transfer
3. Non-verbal Communication – Dumb Charade

**UNIT V**

1. Oral Presentations
2. Précis Writing and Paraphrasing
3. Reading Comprehension and spotting errors

**PRESCRIBED SOFTWARE FOR PRACTICE:**

Sky Pronunciation, Pro-power 2 & Globarena

**Reference Books**

1. Academic writing: A handbook for international students, Bailey, Stephen, Routledge, 2014.
2. Skillful Level 2 Reading & Writing Student's Book Pack (B1) Macmillan Educational.
3. Cambridge Academic English (B2), Hewings, Martin. 2012.
4. Effective Technical Communication, Ashrif Rizvi, TataMcGrahill, 2011
5. Technical Communication by Meenakshi Raman & Sangeeta Sharma,3rd Edition, O U Press 2015.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | - | - | - | - | - | - | - | 3 | - | - | 2 | - |
| **CO2** | 3 | 3 | - | - | - | - | - | - | 3 | 3 | - | - | 1 | - |
| **CO3** | 2 | 2 | - | - | - | - | - | - | - | 3 | - | 2 | - | 1 |
| **CO4** | 3 | - | - | - | - | - | - | - | - | 3 | - | 2 | 1 | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**I B.Tech – II Semester (Common to all Branches)**

| L | T | P | C |
|---|---|---|---|
| - | - | 3 | 1.5 |

## 20ACS05 PROBLEM SOLVING AND PROGRAMMING USING PYTHON LAB

## Course Outcomes:

After Completion of the course the student will be able to

1. Write, Test and Debug Python Programs
2. Implement Conditionals and Loops for Python Programs
3. Use functions and represent Compound data using Lists, Tuples and Dictionaries
4. Read and write data from & to files in Python

## WEEK 1

a. Write a python script to display a simple message

b. Write a python script to perform basic arithmetic operations on two values which are accepted from the user.

## WEEK 2

a. Write a python script to calculate the factorial of a given number.

b. Write a python script to calculate sum of individual digits of a given number.

c. Write a Python program that prompts the user for two floating-point values and displays the result of the first number divided by the second with exactly six decimal places displayed.

## WEEK 3

a. Write a python script to find the largest number among three numbers and display them in ascending order using if-else construct.

b. Write a python script to display Fibonacci sequence of numbers using while loop, for loop and do-while loop constructs.

c. Write a python script to display the prime number series up to the given N Value.

## WEEK 4

a. Write a Python program

i. To calculate sum all the items in a list.

ii . To remove duplicates from a list.

iii. To find the list of words that are longer than n from a given list of words.

iv. To get the difference between the two lists.

v. To append a list to the second list.

b.Write a Python program to print a specified list after removing the $0^{th}$, $4^{th}$ and $5^{th}$ elements.

Sample List : ['Red', 'Green', 'White', 'Black', 'Pink', 'Yellow']

Expected Output : ['Green', 'White', 'Black']

c.Write a python script to arrange the given list of elements in ascending or descending order.

# WEEK 5

a. To write a python program to create, slice, change, delete and index elements using Tuple.

b. Write a Python program to replace last value of tuples in a list.

Sample list: [(10, 20, 40), (40, 50, 60), (70, 80, 90)]

Expected Output: [(10, 20, 100), (40, 50, 100), (70, 80, 100)]

# WEEK 6

a. Write a program to demonstrate working with dictionaries in Python

# WEEK 7

a. Write a Python program

i. To create a set.

ii. To remove item(s) from a set.

iii. To remove an item from a set if it is present in the set.

iv. To create a union and intersection of sets.

v. To create set difference.

# WEEK 8

a. Write a python script to demonstrate string methods.

b. Write a Python program to count the number of characters (character frequency) in a string.

Sample String: google.com'

Expected Result : {'g': 2, 'o': 3, 'l': 1, 'e': 1, '.': 1, 'c': 1, 'm': 1}

c. Write a Python program to reverse a string.

*Sample String* : "1234abcd"

*Expected Output* : "dcba4321"

d. Write a Python script that takes input from the user and displays that input back in upper and lower cases.

e. Write a Python script to get a string made of 4 copies of the last two characters of a specified string (length must be at least 2).

Sample Input /Output

Input: Python – Output: onononon

Input: Exercises – Output: eseseses

f. Write a Python function that checks whether a passed string is palindrome or not.

## WEEK 9

a. Write a python script to find GCD of two numbers using recursive and non recursive functions.

b. Write a python script to convert the following using functions:

i. Fahrenheit to Celsius temperature.
ii. Celsius to Fahrenheit temperature.

## WEEK 10

a. Write a python script to demonstrate the Exception Handling.

## WEEK 11

a. Write a program that inputs a text file. The program should print all of the unique words in the file in alphabetical order

b. Write a script named copyfile.py. This script should prompt the user for the names of two text files. The contents of the first file should be the input that to be written to the second file.

## WEEK 12

a. Write a program to demonstrate a) arrays b) array indexing such as slicing, integer array indexing and Boolean array indexing along with their basic operations in NumPy.

b. Write a program to compute summary statistics such as mean, median, mode, standard deviation and variance of the given different types of data.

## WEEK 13

a. Write a python script to implement inheritance.

b. Write a python script to implement constructor.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 3 | | | | | | | 2 | | 3 | | 1 | |
| CO2 | 2 | 2 | | | | | | | | | | | | 2 |
| CO3 | 2 | 2 | | | | | | | | | | | 2 | |
| CO4 | 2 | 2 | | | | | | | | | | | | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING ANDTECHNOLOGY (AUTONOMOUS)

**I B.Tech I Semester (Common to CE, ME, ECE, , CSE (DS) & CSE (AI &ML)**
**I B.Tech II Semester (Common to EEE, CSE, IT, CSE (DS) & CSE (AI &ML))**

| L | T | P | C |
|---|---|---|---|
| **0** | **0** | **3** | **1.5** |

**20AHS06 ENGINEERING CHEMISTRY LAB**

**Course Outcomes**:

After completion of practical, student will be able to

1. Estimate the amount of metal ions, hardness of water, chlorides in water, acidity, alkalinity, dissolved oxygen in water by using volumetric analysis.
2. Demonstrate the importance of viscosity index, flash point and fire point of lubricants and to prepare a polymer.
3. Apply pH meter, conductivity meter and potentiometer to find the normality and amounts of substances in solution

Any **TEN** of the following experiments

1. Estimation of Hardness of water by EDTA method.
2. Estimation of Chlorides in Water sample.
3. Determination of acid strength by using a pH meter (I) Strong acid VS Strong base (II) Weak acid Vs Strong base.
4. Estimation of Copper using EDTA by complexometric method.
5. Determination of effect of temperature on absolute and kinematic viscosity of oils through Redwood viscometer No.1.
6. Estimation of Ferrous Ion by Potentiometry using standard Potassium Dichromate in a Redox reaction.
7. Determination of rate of corrosion by weight loss method.
8. Determination of acid strength by Conductometric method – Strong acid VS Strong base.
9. Determination of Alkalinity of water sample.
10. Determination of Acidity of water sample.
11. Estimation of Dissolved Oxygen in water by Winkler's method.
12. Estimation of Ferrous Ion by Potassium Dichromate method.
13. Determination of Flash and Fire point by using Pensky Marten's apparatus.
14. Preparation of Phenol-Formaldehyde resin.
15. Determination of moisture content in a coal sample

**Text Books:**


1. Chemistry pre-lab manual by Dr K. N. Jayaveera and K.B. Chandra Sekhar, S.M. EnterprisesLtd., 2007.
2. Vogel'S text book of Quantitative Inorganic Analysis, ELBS Edition, 1994.

**Equipment Required:**

1. Glassware: Burettes, Pipettes, Standard Flasks, Beakers, Measuring jars, BOD bottles and Reagent bottles.
2. Analytical balance,
3. Pensky Marten's apparatus
4. Redwood viscometer,
5. Conductometer,
6. Potentiometer.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 1 | 2 |
| CO2 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 2 | 1 |
| CO3 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 1 | 1 |

**Sri Venkateswara College of Engineering and Technology**
**(Autonomous)**

**I B.Tech I Semester (Common to CE, ME & ECE)**
**I B.Tech II Semester (Common to EEE, CSE, IT, CSE(DS) & CSE(AI &ML) )**

| L | T | P | C |
|---|---|---|---|
| 2 | - | - | - |

# 20AMB01 DESIGN THINKING

(Mandatory Course)

## Course Outcomes:

After completion of the course the student will be able to

**1.** Analyze design thinking concepts and principles to perform human centered design process for creative problem solving.

**2.** Create empathy maps to visualize user attitudes and behavior for gaining insights of customers.

**3.** Develop innovative products or services for a customer base using ideation techniques.

**4.** Build prototypes for complex problems using gathered user requirements.

**5.** Apply design thinking tools techniques to produce good design and relevant products or services for a specific target market.

**6.** Improve prototype by testing it with a specific set of users for making it sustainable by following ethics.

## UNIT I: INTRODUCTION TO DESIGN THINKING

Design Thinking Process: Types of the thinking process, Common methods to change the human thinking process, Design thinking: Definition, Origin of design thinking, Importance of design thinking, Design vs Design thinking, Problem solving, Understanding design thinking and its process model, Design thinking tools.

## UNIT II: EMPATHIZE

Design thinking phases, How to empathize, Role of empathy in design thinking, purpose of empathy maps, Things to be done prior to empathy mapping, Activities during and after the session, Understanding empathy tools : Customer Journey Map, Personas.

## UNIT III: IDEATION

Challenges in idea generation, need for systematic method to connect to user, Visualize, Empathize, and Ideate method, Importance of visualizing and empathizing before ideating, Applying the method, Ideation Tools: How Might We? (HMW), Story board, Brainstorming.

## UNIT IV: PROTOTYPING

What is a prototype? - Prototyping as a mindset, prototype examples, prototyping for products; Why we prototype? Fidelity for prototypes, Process of prototyping- Minimum Viable prototype.

## UNIT V: TESTING PROTOTYPES

Prototyping for digital products: What's unique for digital products, Preparation; Prototyping for physical products: What's unique for physical products, Preparation; Testing prototypes with users.

### Text Books:


1. S.Salivahanan, S.Suresh Kumar, D.Praveen Sam, "Introduction to Design Thinking",Tata Mc Graw Hill, First Edition,2019.
2. Kathryn McElroy, "Prototyping for Designers: Developing the best Digital and Physical Products", O'Reilly, 2017.


### Reference Books:


1. Michael G. Luchs, Scott Swan , Abbie Griffin,"Design Thinking – New Product Essentials from PDMA", Wiley, 2015.
2. Vijay Kumar, "101 Design Methods: A Structured Approach for Driving Innovation in Your Organization", 2012.


## ADDITIONAL LEARNING RESOURCES:

1. https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process
2. https://www.ibm.com/design/thinking/page/toolkit
3. https://www.interaction-design.org/literature/article/define-and-frame-your-design-challenge-by-creating-your-point-of-view-and-ask-how-might-we
4. https://hbr.org/2018/09/design-thinking-is-fundamentally-conservative-and-preserves-the-status-quo
5. https://hbr.org/2018/09/why-design-thinking-works
6. https://hbr.org/2015/09/design-thinking-comes-of-age
7. https://www.culturepartnership.eu/en/article/ten-tools-for-design-thinking
8. https://nptel.ac.in/courses/109/104/109104109/
9. https://nptel.ac.in/courses/110106124/

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | | 3 | 2 | | | | | | | | | 1 | |
| CO2 | 1 | 3 | | | | | | | | | | | | 2 |
| CO3 | 1 | | | 3 | 1 | | | | | | | | | |
| CO4 | | 3 | | 3 | | | | | | | | | 1 | |
| CO5 | | | | | 1 | 2 | 3 | | | | | | | 3 |
| CO6 | 1 | 3 | 1 | | | | 1 | 1 | | | | | | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**II B.Tech-I Semester (Common to All Branches)**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 3 |

## 20AHS10 NUMERICAL METHODS

**Course Outcomes:**

After completion of the course the student will be able to

1. Classify the algebraic and non algebraic equations and solve them using different iterative methods.
2. Apply numerical techniques to solve engineering problems.
3. Interpret the data and drawing the valid conclusion.
4. Evaluate the numerical solutions of ordinary differential equations using single step and multistepmethods.
5. Solve real world problems using solutions of partial differential equations.

**UNIT-I**

**SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS**

Introduction–Inter mediate value theorem-The Bisection method-The method of false position Newton - Raphson method-Iteration Method - Problems on Iterative methods. Interpolation: Forward Differences - backward differences-Newton's forward and backward differences formulae for interpolation –Problems on Interpolation - Lagrange's interpolation formula-Inverse interpolation- Problems.

**UNIT-II**

**NUMERICAL DIFFERENTIATION AND INTEGRATION**

Approximation of derivatives using interpolation polynomials-First and second order derivatives-Problems on numerical differentiation. Newton Cotes formulae – Numerica lintegration using Trapezoidalrule, Simpson's 1/3 rule and Simpson's 3/8$^{th}$ Rule.

**UNIT-III**

**CURVE FITTING:**

Fitting of Curves by method of Least - squares – Fitting of Straight lines – Fitting of second degree Parabola-Fitting of the exponential curve- Fitting of the power curve – Problems – Regression- Correlation–Problems on interpretation of data–Drawing conclusions.

**UNIT-IV**

**NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS** Taylor's series-

Picard's method of successive Approximations -Euler's and Modified Euler's Method-

Problems onsingle step methods– Runge – Kutta Methods – Predictor – corrector

method-Milne's method.

**UNIT-IV**

**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'sequation.

**TextBooks:**

1. Dr.B.S.GREWAL, Higher Engineering Mathematics. Kanna Publications, 42$^{th}$ edition.
2. B.V.Ramana, AText Book of Engineering Mathematics-I,TATAMCGRAWHILL
3. E.Rukmangadachari and KeshavaReddy, A Text Book of Engineering Mathematics-I, PEARSON EDUCATION.
4. T.K.V.Iyengar,B.Krishna Gandhi and Others, A Text Book of Engineering Mathematics–I, S. Chand and Company.

**References:**

1. Erwin Kreyszig, Advanced EngineeringMathematics.JOHNWILEY&SONS-2016.
2. Jain.M.K, Iyengar T..K.V, Jain.R.K. Numerical Methods For Scientific And Engineering Computation. New age International Publishers.
3. N.Bail, M.Goyal &C.Walking, A Text Book of Advanced Engineering Mathematics-AComputerApproach.
4. Pal, Mathematical Methods, Oxford University Press, 2009.
5. S.S.Sastry,Introductory Methods of Numerical Analysis,Printice Hallof India publications, 2011

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PS02** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | - | - | - | - | - | - | - | - | - | - | | |
| **CO2** | 3 | 3 | - | - | - | - | - | - | - | - | - | - | | 1 |
| **CO3** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 1 | |
| **CO4** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | | |
| **CO5** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(Autonomous)**

**II B.Tech I Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML))**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

## 20ACS06 - COMPUTER ORGANIZATION AND ARCHITECTURE

**Course Outcomes:**

After Completion of the course the student will be able to:

1. Recognize the functionalities of computer architecture and its components.
2. Apply various basic algorithms and operations to solve complex arithmetic problems complying with IEEE standards.
3. Apply the concepts of memory management for analysis of system performance.
4. Identify the I/O components of computer architecture and their performance.
5. Describe pipelining mechanisms and recognize different parallel machine models.

**UNIT I** **7 hrs**

**Introduction to computer systems** - Overview of Organization and Architecture -Functional components of a computer -Registers and register files-Interconnection of components-Organization of the von Neumann machine and Harvard architecture-Performance of processor. Data representation, fixed and floating point and error detecting codes.

**UNIT II** **8 hrs**

**Fundamentals of Computer Architecture:** Introduction to ISA (Instruction Set Architecture)-Instruction formats- Instruction types and addressing modes- Instruction execution (Phases of instruction cycle)- Assembly language programming-Subroutine call and return mechanisms-Single cycle Data path design-Introduction to multi cycle data path-Multi cycle Instruction execution. Arithmetic micro operations, logic micro operations, shift micro operations, arithmetic logic shift unit.

**UNIT III** **8 hrs**

**Micro programmed Control**: Control memory, address sequencing, micro program example, and design of control unit. Computer Arithmetic: Fixed point representation of numbers-algorithms for arithmetic operations: multiplication (Booths, Modified Booths) - division (restoring and non-restoring) - Floating point representation with IEEE standards and algorithms for common arithmetic operations- Representation of non-numeric data (character codes).

**UNIT IV** **9 hrs**

**THE MEMORY SYSTEM:** Memory systems hierarchy-Main memory organization-Types of Main memory-memory inter- leaving and its characteristics and performance- Cache memories: address mapping-line size- replacement and policies- coherence- Virtual memory systems- TLB- Reliability of memory systems- error detecting and error correcting systems.

**INPUT/OUTPUT ORGANIZATION**: I/O fundamentals: handshaking, buffering-I/O techniques: programmed I/O, interrupt-driven I/O, DMA- Interrupt structures: vectored and prioritized-interrupt overhead- Buses: Synchronous and asynchronous- Arbitration.

**UNIT V** **8 hrs**

**Device Subsystems**: Externa lst- RAID Levels- I/O Performance. Performance Enhancements: Classification of models - Flynn’s taxonomy of parallel machine models (SISD, SIMD, MISD,MIMD)- Introduction to Pipelining- Pipelined data path-Introduction to hazards. Contemporary issues: Recent Trends: Multiprocessor architecture: Overview of Shared Memory architecture, Distributed architecture.

**Text Books:**

1. M. Morris Mano, Computer System Architecture, 3rdedition,PHI,India, 2006.
2. Carl Hamacher, ZvonksVranesic, SafeaZaky, Computer Organization, 5th edition, McGraw Hill, New Delhi,India,2010.

**Reference Books:**

1. William Stallings, Computer Organization and Architecture, designing for performance, 8 th edition, Prentice Hall, NewJersy, 2010.
2. Andrew S. Tanenbaum, Structured Computer Organization, 5th edition, Pearson Education Inc, NewJersy, 2006.
3. Sivarama P. Dandamudi, Fundamentals of Computer Organization and Design, Springer Int. Edition, USA, 2003.

**CO-PO’s mapping:**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | | | | | | | | | | | | 3 | |
| CO2 | 2 | 3 | | 3 | | | | 3 | | | | | 3 | |
| CO3 | 2 | 3 | | | | | | | | | | | 3 | 1 |
| CO4 | 3 | | | | | | | | | | | | | |
| CO5 | 3 | | | | | | | | | | | | | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**(Autonomous)**

**II B.Tech I Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML))**
**III B.Tech I Semester EEE (Open Elective-I)**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

## 20ACS07 - OBJECT ORIENTED PROGRAMMING THROUGH JAVA

**Course Outcomes:**

After Completion of the course the student will be able to:

1. Demonstrate basic principles of OOP in java programming.
2. Apply the concepts of inheritance packages and interfaces in code reusability.
3. Apply the principles of exception handling in designing the customized exception to handle errors in application software.
4. Apply concepts of multithreading to solve problems in parallelism.
5. Apply concepts of Enumeration and Collections Framework in solving real time problems

**UNIT-I** **9 hrs**

Java History, Java Features, Object Oriented Features, Tokens-Constants, Identifiers, Keywords, Operators. Data types, type conversions, Statements-Expression, selection, Loop, Jump, Label and block statements. Arrays-one dimensional, two dimensional, String class, StringBuffer class, String Builder.

**UNIT –II** **8 hrs**

Fundamentals, declaring objects, object references, Methods, Constructors-default, parameterized constructors, garbage collection, this keyword. Method Overloading, constructor overloading, static, nested and inner classes, command-line arguments.

Inheritance- Basics, Creating multilevel hierarchy, using super, method overriding, dynamic method dispatch, abstract classes, using final in inheritance.

**UNIT-III** **6 hrs**

Packages-definition, class path, Access protection, importing packages.

Interfaces- definition, implementing interfaces, nested interfaces, variables and methods in interfaces, recent advances in interfaces, multiple inheritance using interfaces.

**UNIT - IV**

**Exception Handling:** Fundamentals, Exception types, uncaught exceptions, using try and catch, multiple catch clauses, nested try statements, throw, throws, finally, chained exceptions, custom exceptions.

**Multithreading:** Thread life cycle, Java Thread Model, Main thread, creation of child thread, creation of multiple child threads, isAlive(),join(), wait(),notify(),notifyAll(), synchronization, inter thread communication.

**UNIT- V** **9 hrs**

**Enumerations, Wrapper classes, auto boxing, annotations.**

Lambda expressions-introduction, Block lambda expressions, Generic functional interfaces, passing lambda expressions as arguments, lambda expressions and exceptions, lambda expressions and variable capture. Collections Framework: Collection interfaces and classes. Iterators, split Iterators, Map, comparators, Arrays, String tokenizer, Bitsets, Random, Scanner class.

**Text Books:**

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill Education (India) Pvt. Ltd.
2. Java How to Program, 10th Edition, Paul Dietel, Harvey Dietel, Pearson Education.

**Reference Books:**

1. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, Pearson Education.
2. Core Java Volume – 1 Fundamentals, Cay S. Horstmann, Pearson Education.
3. Java Programming for core and advanced learners, Sagayaraj, Dennis, Karthik and Gajalakshmi, University Press
4. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
5. Object Oriented Programming through Java, P. Radha Krishna, and University Press.
6. Programming in Java, S. Malhotra, S. Chaudhary, 2nd edition, Oxford Univ. Press.
7. Java Programming and Object-oriented Application Development, R.A. Johnson, Cengage Learning.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | | | | | | | | | | | | 3 | |
| CO2 | 2 | 3 | | 3 | | | | 3 | | | | | 3 | 1 |
| CO3 | 2 | 3 | | | | | | | | | | | 3 | 1 |
| CO4 | 3 | | | | | | | | | | | | | |
| CO5 | 3 | | | | | | | | | | | | | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(Autonomous)**

**II B.Tech I Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML))**
**III B.Tech I Semester (Common to CSE (DS))**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

## 20AIT01 - AUTOMATA AND COMPILER DESIGN

**Course Outcomes:**

After Completion of the course the student will be able to:

1. Demonstrate knowledge to represent the different programming language constructs (keywords, expressions, statement) in the machine understandable language by using the basic tools (REs, Automata) of automata theory.
2. Analyze various intermediate forms of source programs.
3. Apply the code optimization techniques in the generation of code for a given real time problem.

**UNIT-I**

**COMPILER, FORMAL LANGUAGE, REGULAR EXPRESSIONS:**

Introduction, Phases of Compiler, Specification of Token, Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA, Conversion of regular expression to NFA, NFA to DFA.

**UNIT-II**

**CONTEXT FREE GRAMMARS AND GRAMMAR PARSING:**

Context free grammars, derivation, parse trees, ambiguity LL (K) grammars and LL (1) parsing. Bottom up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.

**UNIT-III**

**SEMANTICS, RUN TIME STORAGE MANAGEMENT:**

Syntax directed translation, S-attributed and L-attributed grammars, Chomsky hierarchy of languages and recognizers, Type checking, type conversions, equivalence of type expressions, overloading of functions and operations. Storage organization, storage allocation strategies, scope access to non-local names, parameter passing, and language facilities for dynamics storage allocation.

**UNIT-IV**

**INTERMEDIATE CODE GENERATION**

Intermediate code – abstract syntax tree, translation of simple statements and control flow statements, Back patching, procedure calls.

**UNIT-V**

**CODE OPTIMIZATION AND CODE GENERATION**:

Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs. Machine dependent code generation, Issues in the design of code generation, object code forms, generic code generation algorithm, Register allocation and assignment. DAG representation of Basic Blocks.

**Text Books:**

1. Compilers Principles, Techniques and Tools, Alfred V.Aho and Jeffrey D.Ullman, Ravi sethi, Pearson Education.

**Reference Books:**

1. Modern Compiler Construction in C, Andrew W. Appel., Cambridge University Press.
2. Theory of Computation, S. Balakrishnan and V.D. Ambeth Kumar, ACME Learning Publisher, New Delhi.
3. Principles of Compiler Design 3rd Edition, Balakrishnan S, Sai Publishers.

**CO-PO's Mapping:**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | 1 | | | | | | | | | 2 | 1 | 2 |
| CO2 | 3 | 2 | 3 | | | | | | | | | | 3 | |
| CO3 | 2 | | 2 | | | | | | | | | 2 | 1 | 3 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(Autonomous)**

**II B.Tech I Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML))**
**III B.Tech II Semester EEE,ECE (Open Elective-II)**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

## 20ACS08 - RELATIONAL DATABASE MANAGEMENT SYSTEMS

**Course Outcomes:**
At the end of the course the student will be able to:

1. Demonstrate the basic elements of a relational database management system.
2. Design entity relationship model and convert entity relationship diagrams into RDBMS and formulate SQL queries.
3. Apply the concepts of ER-modelling and normalization to design practical data models
4. Analyze transaction processing, concurrency control and storage methods for database management.

**UNIT –I** **8 hrs**

**Introduction to Databases:** Introduction, Characteristics of database approach, Advantages of using the DBMS approach, History of database applications. Overview of Database Languages and Architectures: Data Models, Schemas, and Instances. Three schema architecture and data independence, database languages, and interfaces, The Database System environment. Conceptual Data Modelling using Entities and Relationships: Entity types, Entity sets, attributes, roles, and structural constraints, Weak entity types, ER diagrams, examples, Specialization and Generalization.

**UNIT-II** **9 hrs**

**Relational Model:** Relational Model Concepts, Relational Model Constraints and relational database schemas, Update operations, transactions, and dealing with constraint violations. Relational Algebra: Unary and Binary relational operations, additional relational operations (aggregate, grouping, etc.) Examples of Queries in relational algebra. Mapping Conceptual Design into a Logical Design: Relational Database Design using ER-to-Relational mapping. SQL: SQL data definition and data types, specifying constraints in SQL, retrieval queries in SQL, INSERT, DELETE, and UPDATE statements in SQL, Nested Queries, aggregation operators, NULL values, complex integrity constraints in SQL, triggers and active data bases.

**UNIT-III** **9 hrs**

**SQL:** Advances Queries: More complex SQL retrieval queries, Specifying constraints as assertions and action triggers, Views in SQL, Schema change statements in SQL. Schema Refinement: Problems caused by redundancy, decompositions, problems related to decomposition, reasoning about functional dependencies, FIRST, SECOND, THIRD normal forms, BCNF, lossless join decomposition, multi-valued dependencies, FOURTH normal form, FIFTH normal form.

**UNIT-IV** **9 hrs**

**Normalization Algorithms:** Inference Rules, Equivalence, and Minimal Cover, Properties of Relational Decompositions, Algorithms for Relational Database Schema Design, Nulls, Dangling tuples, and alternate Relational Designs, Further discussion of Multivalued dependencies and 4NF, Other dependencies and Normal Forms.

**Transactions:** Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability, Concurrency: Concurrency control, Lock Based Protocols, Timestamp Based Protocols, Validation- Based Protocols, Multiple Granularity, Recovery and Atomicity, Log–Based Recovery, Recovery with Concurrent Transactions.

**UNIT-V** **8 hrs**

**Indexing And Hashing:** File Organization, Organization of Records in Files, Ordered Indices, B+ Tree Index Files, B,Tree Index Files, Multiple Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices.

**Text Books:**

1. Ramez Elmasri and Shamkant B. Navathe, "Fundamentals of Database Systems", 7th Edition, 2017, Pearson.
2. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", Fifth Edition, Tata McGraw Hill, 2006.

**Reference Books:**

1. Ivan Bayross,"SQL, PL/SQL programming language of Oracle", BPB Publications 4th edition, 2010.
2. Raghurama Krishnan, Johannes Gehrke, "Data base Management Systems", TATA McGraw,Hill 3rd Edition,2007.
3. Coronel, Morris, and Rob, Database Principles Fundamentals of Design, Implementation and Management, Cengage Learning 2012.

4. S.K.Singh, “Database Systems Concepts, Design and Applications”, First edition, Pearson Education, 2006.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | **3** | **2** | **2** | | | | | | | | | | **3** | |
| **CO2** | **3** | **2** | **3** | | **3** | | | | | | | | **3** | |
| **CO3** | **2** | **2** | **3** | | | | | | | | | | **3** | **2** |
| **CO4** | **3** | **3** | | | | | | | | | | | **3** | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(Autonomous)**

**II B.Tech I Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML))**

| L | T | P | C |
|---|---|---|---|
| - | - | 3 | 1.5 |

## 20ACS09 – OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

**Course Outcomes:**

After Completion of the practical the student will be able to:

1. Apply syntactic constructs of JAVA to solve engineering problems.
2. Solve real time problems using interfaces, packages, Exception Handling, Collection Framework and Multithreading.
3. Work independently and in team to solve competitive problems.

**Week-1:**

Write a Java program that prints all real solutions to the quadratic equation ax2+ bx + c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions.

The Fibonacci sequence is defined by the following rule: The fir two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses recursive functions to print the nth value in the Fibonacci sequence

Write a Java program that uses non-recursive functions to print the nth value in the Fibonacci sequence

**Week-2**:

a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.

b) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use String Tokenizer class of java. util)

**Week-3:**

a) Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.

b) Write a Java program for sorting a given list of names in ascending order. c) Write a Java program to make frequency count of words in a given text.

**Week-4:**

a) Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.

b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.

c) Write a Java program that displays the number of characters, lines and words in a text file.

**Week-5:**

a) Write a Java program that creates three threads. First thread displays ―Good Morning‖ every one second, the second thread displays ―Hello‖ every two seconds and the third thread displays ―Welcome‖ every three seconds.

b) Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

**Week 6**

a) Write a java program to create an abstract class named Shape that contains an empty method named number of Sides ( ).Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains.

**Week 7**

a) Write a java program to implement interface using lambda expressions.

b) Write a Java Program to implement comparator using lambda expressions.

c) Write a Java Program to illustrate the iteration of enumeration elements.

**Week 8**

Create an enumeration called Players that have some names and runs scored. Create a constructor and a method that will return the number of runs scored by each player or enumerator or enum constant. Using values () method to iterate the enumerator and display the number of runs scored by each player.

**Week 9**

In a given string, find the first non-repeating character .You are given a string, that can contain repeating characters. Your task is to return the first character in this string that does not repeat. i.e., occurs exactly once. The string will contain characters only from English alphabet set, i.e., ('A' - 'Z') and ('a' - 'z'). If there is no non-repeating character print the first character of string.

**Week 10**

Practice sessions on HackerRank and HackerEarth

Example: HackerEarth –jumble letter, missing alphabets

HackerRank -bear and steady gene, super reduced string, gemstones

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | **3** | **2** | **2** | **3** | | | | | | | | | **3** | |
| **CO2** | **3** | **3** | **3** | **3** | | | | | | | | | **3** | |
| **CO3** | **3** | **3** | **3** | **3** | | | | | **3** | | | **3** | | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(Autonomous)**

**II B.Tech I Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML))**

| L | T | P | C |
|---|---|---|---|
| - | - | 3 | 1.5 |

**20AIT02 - AUTOMATA AND COMPILER DESIGN LAB**

**Course Outcomes:**

d) After Completion of the practical the student will be able to:

1. Define the role of lexical analyzer, use of regular expressions and transition diagrams.
2. Analyze the working of lex and yacc compiler for debugging of programs.
3. Demonstrate the working of compiler at various stages
4. Demonstrate the working nature of compiler tools.

**List of Experiments:**

1. Write a C Program to implement NFAs that recognize identifiers, constants, and operators of the mini language.
2. Write a C Program to implement DFAs that recognize identifiers, constants, and operators of the mini language.
3. Design a Lexical analyzer for the given language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value.
4. Implement the lexical analyzer using JLex, flex or lex or other lexical analyzer generating tools.
5. Recognition of a valid variable which starts with a letter and followed by any number of letters or Digits.
6. Design Predictive parser for the given language.
7. Design LALR bottom up parser for the given language.
8. Implementation of the symbol table.
9. Implementation of type checking.
10. Implementation of Dynamic Memory Allocation (Stack, Heap, Static)
11. Construction of a DAG (Directed Acyclic Graph)
12. Implementation of the Backend of the Compiler.

**Text Books:**

1. Introduction to Theory of computation, Sipser, $2^{nd}$ Edition, Thomson.
2. Compilers Principles, Techniques and Tools Aho , Ullman, ravisethi, Pearson Education

**Reference Books:**

1. Modern Compiler construction in C, Andrew W.Appel Cambridge University Press.
   Compiler Construction, LOUDEN, Cengage Learning.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | | | | | | | | | | | 3 | |
| CO2 | 3 | 3 | | | 2 | | | | | | | | 3 | |
| CO3 | 3 | | | | | | | | | | | | 2 | |
| CO4 | 3 | | | | 2 | | | | | | | | 2 | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(Autonomous)**

**II B.Tech I Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML))**

| L | T | P | C |
|---|---|---|---|
| - | - | 3 | 1.5 |

## 20ACS10 - RELATIONAL DATABASE MANAGEMENT SYSTEMS LAB

**Course Outcomes:**

After Completion of the practical the student will be able to:

1. Design and implement a database schema for given problem.
2. Implement SQL queries using query language tools.
3. Apply the normalization techniques for development of application software to realistic problems.
4. Formulate queries using SQL tools for DML/DDL/DCL commands.

### LIST OF EXPERIMENTS

1. Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.

2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOT EXISTS, UNION, INTERSECT, EXCEPT operators.. Example:, Select the roll number and name of the student who secured fourth rank in the class.

3. Using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING, Creation and dropping of Views.

4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)

5. i) Creation of simple PL/SQL program which includes declaration section, executable section and exception –handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found) ii) Implement COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

6. Develop a program that includes the features NESTED IF, CASE and CASE expression.

7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions.

8. Program development using a creation of procedures, passing parameters IN and OUT of PROCEDURES.

9. Program development using the creation of stored functions, invoke functions in SQL Statements and write complex functions.

10. Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.

11. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

12. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers.

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | **3** | **2** | **3** | | | | | | | | | | **3** | |
| **CO2** | **3** | **3** | | | **3** | | | | | | | | **3** | |
| **CO3** | **3** | **3** | | | | | | | | | | | **3** | |
| **CO4** | **3** | **3** | | | **3** | | | | | | | **2** | **3** | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**II B.Tech I Semester**

| L | T | P | C |
|---|---|---|---|
| 1 | 0 | 2 | 2 |

## 20AIT03 SOFTWARE DEVELOPMENT USING PYTHON
## (Skill Course)

**Course Outcomes:**

After Completion of the course the student will be able to:

CO1: Develop algorithmic solutions to simple computational problems.
CO2: Develop and execute simple Python programs.
CO3: Write simple Python programs using conditionals and looping for solving problems.
CO4: Decompose a Python program into functions.
CO5: Represent compound data using Python lists, tuples, dictionaries etc.

## LIST OF EXPERIMENTS

**Task-1: Text Detection with Open CV in Python:**

Extracting the text from historical documents is challenge. The transforming hard document to soft document is time consuming process. To overcome this issue, the Open CV will solve our problem. Develop a python application that convert the given image to text.

**Task-2: YouTube Video Downloader using Python:**
Now days, YouTube become the best teacher for us to learn anything. But, watching videos without internet is not possible. Here, you create a python application to download the video form YouTube.

**Task-3: Website Blocker using Python:**
When we surf the internet, many unwanted websites keep showing up. In this case study, you can address this issue using python

**Task-4: Design the Graphical Calculator using Python**

Although there isn’t much use of a calculator, however, building your graphical UI calculator will make you familiar with a library like Tkinter in which you can create buttons to perform different operations and display results on a screen.

**Task-5: Speed Typing Test using Python**

Do you remember the old typing test game which was used in Windows XP and before? You can create a similar program that tests your typing speed. First, you need to create a UI using a library like Tkinter. Then create a fun typing test that displays the user speed, accuracy, and words per minute in the end.

**Task-6: Data Science in Education:**

Data Science has also changed the way in which students interact with teachers and evaluate their performance. Instructors can use data science to analyze the feedback received from the students and use it to improve their teaching. Use Predictive modeling Data Science that can predict the drop-out rate of students based on their performance and inform the instructors to take necessary precautions.

**TEXT BOOKS:**

1. Allen B. Downey, “Think Python: How to Think like a Computer Scientist”, 2nd Edition, O’Reilly Publishers, 2016.
2. Karl Beecher, “Computational Thinking: A Beginner's Guide to Problem Solving and programming”, 1st Edition, BCS Learning & Development Limited, 2017.

**REFERENCES:**

1. Paul Deitel and Harvey Deitel, “Python for Programmers”, Pearson Education, 1st Edition, 2021.
   2. G Venkatesh and Madhavan Mukund, “Computational Thinking: A Primer for Programmers and Data Scientists”, 1st Edition, Notion Press, 2021.
   3. John V Guttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data‘‘, Third Edition, MIT Press2021.

2. https://docs.python.org/3/tutorial/
3. 2. https://docs.python.org/3/tutorial/
4. 3. https://www.tutorialspoint.com/python/index.htm
5. 4. https://www.javatpoint.com/python-tutorial
6. 5. https://www.learnpython.org/

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C01** | **3** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **2** | **-** |
| **C02** | **3** | **3** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **2** | **-** | **2** | **-** |
| **C03** | **3** | **2** | **3** | **-** | **1** | **-** | **-** | **-** | **-** | **-** | **2** | **3** | **2** | **-** |
| **C04** | **-** | **1** | **2** | **1** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **2** | **-** | **1** |
| **C05** | **-** | **-** | **-** | **1** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **1** | **-** | **1** |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**II B.Tech – I Semester (EEE, ECE, CSE, IT)**

| L | T | P | C2 |
|---|---|---|---|
| | - | - | - |

### 20AMB02 - UNIVERSAL HUMAN VALUES-I
**(Mandatory course)**

**Course Outcomes:**

After completion of the course students will be able to

1. Apply the principles of natural acceptance to design a happy and prosperous living with responsibility.
2. Analyse the elements of sentient 'I' and material human body to design a living with responsibility for happiness andprosperity.
3. Apply the principles of 'trust' and 'respect' for designing a society with universal human order.
4. Analyse the situations causing imbalance in nature and further design an ecosystem for peaceful co-existence.
5. Apply the principles of science technology and management to solve contemporary problems professionally andethically.

**UNIT – I**: **Introduction - Need, Basic Guidelines, Content and Process for Value Education**

Purpose and motivation for the course, recapitulation from Universal Human Values-I; Self-Exploration–what is it? - Its content and process; 'Natural Acceptance' and Experiential Validation-as the process for self-exploration; Continuous Happiness and Prosperity- A look at basic Human Aspirations; Right understanding, Relationship and Physical Facility- the basic requirements for fulfillment ofaspirations of every human being with their correct priority; Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario; Method to fulfil the above human aspirations: understanding and living in harmony at variouslevels.

**UNIT – II: Understanding Harmony in the Human Being - Harmony in Myself** Understanding human being as a co-existence of the sentient 'I' and the material Body; Understanding the needs of Self ('I') and 'Body' - happiness and physical facility; Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer); Understanding the characteristics and activities of 'I' and harmony in 'I'; Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail; Programs to ensure Sanyam and Health.

**UNIT – III: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship**

Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship; Understanding the meaning of Trust; Difference between intention and competence; Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship; Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals; Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

**UNIT – IV: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence**

Understanding the harmony in the Nature; Interconnectedness and mutual fulfilment among the four orders of nature- recyclability and self-regulation in nature; Understanding Existence as Co-existence of mutually interacting units in all- pervasive space;Holistic perception of harmony at all levels ofexistence

**UNIT – V: Implications of the above Holistic Understanding of Harmony on Professional Ethics**

Natural acceptance of human values; Definitiveness of Ethical Human Conduct; Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order; Competence in professional ethics: a) Ability to utilize the professional competence for augmenting universal human order b) Ability to identify the scope and characteristics of people friendly and eco- friendly production systems, c) Ability to identify and develop appropriate technologies and management patterns for above production systems.

Strategy for transition from the present state to Universal Human Order:

a. At the level of individual: as socially and ecologically responsible engineers, technologists andmanagers
b. At the level of society: as mutually enriching institutions andorganizations.

Textbooks:

1. R R Gaur, R Asthana, G P Bagaria, “A Foundation Course in Human Values and Professional Ethics”, 2$^{nd}$ Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1.
2. R R Gaur, R Asthana, G P Bagaria, “Teachers’ Manual for A Foundation Course in Human Values andProfessional Ethics”, 2$^{nd}$ Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2.

Reference Books:

1. Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan, Amar kantak,1999.
2. N. Tripathi, “Human Values”, New Age Intl. Publishers, New Delhi, 2004.The Story of Stuff(Book).
3. Mohandas Karamchand Gandhi “The Story of My Experiments with Truth” E. FSchumacher. “Small is Beautiful”Slow is Beautiful –Cecile Andrews J C Kumarappa “Economy of Permanence” Pandit Sunderlal “Bharat Mein Angreji Raj”Dharampal.
4. Rediscovering India. Mohandas K. Gandhi, “Hind Swaraj or Indian Home Rule”India Wins Freedom - Maulana Abdul Kalam Azad Vivekananda - Romain Rolland (English)Gandhi - Romain Rolland(English).

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 2 | 2 | 3 | 3 | 1 | | | | | | | | 3 | 3 |
| C02 | 2 | 3 | 2 | 1 | 1 | | | | | | | | 2 | 3 |
| C03 | 2 | 2 | 3 | 2 | 2 | | | | | | | | 3 | 3 |
| C04 | 2 | 2 | 3 | 2 | 1 | | | | | | | | 2 | 2 |
| C05 | 3 | 2 | 3 | 2 | 2 | | | | | | | | 3 | 3 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(AUTONOMOUS)**

**II B. Tech - I Semester (Common to All Branches)**

**20AHS11 - Quantitative Aptitude and Reasoning-I (Audit course)**

| L | P | T | C |
|---|---|---|---|
| 2 | - | - | - |

**Course Outcomes:**

After completion of the course the student will be able to

1. Develop the thinking ability to meet the challenges in solving Logical Reasoning problems.
2. Solve campus placements aptitude papers covering Quantitative Ability and Verbal Ability.
3. Apply different placement practice techniques.

**UNIT 1: QUANTITATIVE ABILITY - I**

Vedic Maths – Square - Square root – Cube - Cube root – Fractions – Mathematical operations – Number System – Types of numbers - Divisibility Rule – Unit Digit – Factors and Factorials – Remainder Theorem – Factorization and Trailing Zeroes – LCM And HCF

UNIT 2: QUANTITATIVE ABILITY - II

Arithmetic Progression – Common Difference- Nth Term – Sum of terms – Geometric Progression
– Common Ratio – Nth term – Sum of Terms – Averages - Weighted average – Percentages – Conversion – Increasing and Decreasing in quantity – Change in Percentage – Successivediscount
– Compound Growth

UNIT 3: REASONING ABILITY I

Coding and Decoding – Blood Relations – Directions – Number Series and Letter Series – Ranking and Ordering

UNIT 4: VERBAL I

Verbal analogy - Types - Parts of Speech – Noun, Pronoun, Adjective, Verb, Adverb, Preposition, Conjunction and Interjection - Prepositions –Preposition of Place, Preposition of Placement, Preposition of Time and Preposition of Duration - Articles – Usage of a, an, the, Omission of articles - Sentences - Pattern andTypes.

UNIT 5: SOFT SKILL I

Communication Skills - Self-Confidence - Introductions & Greetings - Presentation Skills - Self- Motivation

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 1 | |
| **CO2** | 1 | 2 | - | - | - | - | - | - | - | - | - | - | | 1 |
| **CO3** | 2 | - | - | - | - | - | - | - | - | - | - | - | 1 | |

**SRI VENKATESWARA COLLEGE OFENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**II B. Tech - II Semester (Common to CE, ME, CSE, CSM & IT)**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 3 |

## 20AHS13 PROBABILITY AND STATISTICS

**Course Outcomes:**

After completion of the course the student will be able to

1. Apply probability distributions to real life problems.
2. Analyze inference theory to make wise decisions about a population parameter.
3. Apply sampling methods in the day-to-day practical life to assess the quality ofcommodities.
4. Apply the testing of hypothesis for large and small samples.

**UNIT-I**
**RANDOM VARIABLES & THEORITICAL DISTRIBUTIONS:**

Introduction on Probability - Discrete and Continuous random variables – Distribution functions – Moment generating functions. Binomial distribution – Poisson distribution – Normal distribution – related properties.

**UNIT-II**
**SAMPLING DISTRIBUTIONS & ESTIMATION:**

Population - Sample - Parameter and Statistic - Characteristics of a good estimator - Consistency - Invariance property of Consistent estimator - Sufficient condition for consistency - Unbiasedness – Sampling distributions of means (known and unknown)- sums and difference. Estimation- Estimator, Estimate, Point estimation – Interval estimation – Bayesian estimation.

**UNIT-III**

**TEST OF HYPOTHESIS:**

Null Hypothesis-Alternative hypothesis-Critical region – Level of Significance-Type I error and Type II errors-One tail test -Two tail tests - Hypothesis concerning one and two means – Hypothesis concerning one and two proportions.

**UNIT-IV**

**TEST OF SIGNIFICANCE:** Student's t-test, test for a population mean, equality of two Population means, paired t-test, F-test for equality of two population variances, $\chi 2$ -Chi-square test for goodness of fit and test for attributes.

ANALYSIS OF VARIANCE – One way and Two way Classifications

**UNIT-V**

**QUEUING THEORY:** Introduction - Queues with impatient customers: Balking and reneging- Classification, stationary process, Binomial process, Poisson process, Birth and death process, - M/M/1 Model –Problems on M/M/1 Model.

**Text Books:**

1. Miller and John Freund. E, Probability & Statistics for Engineers, New Delhi, Pearson Education, 2014.
2. S.P.Gupta,Statistical Methods,33rdEdition,publications SultanChand& Sons.2021.
3. Iyengar, T.K.V., Krishna Gandhi B., Probability & Statistics, New Delhi, S. Chand & Company, 2014.

**References Books:**

1. Arnold O Allen, Probability & Statistics, Academic Press. 2014.
2. Manoj Kumar Srivastava and Namita Srivastava, Statistical Inference Testing of Hypotheses, Prentice Hall of India, 2014.

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | - | - | - | - | - | - | - | - | - | - | | |
| **CO2** | 3 | 3 | - | 1 | - | - | - | - | - | - | - | - | 1 | 2 |
| **CO3** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | | 2 |
| **CO4** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 1 | 1 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING &TECHNOLOGY**
**(AUTONOMOUS)**

| **II B.Tech, II Semester (Common to CSE, CSD, CSM &IT)** | **L** | **T** | **P** | **C** |
|---|---|---|---|---|
| | **3** | **1** | **0** | **3** |

**20AHS14 DISCRETE STRUCTURES & GRAPH THEORY**

**Course Outcomes:**

After Completion of the course the student will be able to

1. Apply the rules of inference to determine the validity of argument.(BL-3,PO1,PO2)
2. Apply lattice theory and Boolean algebra in theory and design of computers.(BL,3,PO1,PO2,PO3)
3. Apply generating functions to solve the combinatorial problems which makes easier to solvebroad spectrum of problems. (BL-3,PO1,PO2)
4. Apply the graph theory and trees in describing structures involving hierarchy. Also used in switching and logical design. (BL-3,PO1,PO2,PO5)

**UNIT-I**

**MATHEMATICAL LOGIC AND PREDICATES**:

Statements and notations, Connectives, Well -formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Predicative logic, Free & Bound variables, Rule of inference, Consistency, proof by contradiction.

**UNIT-II**

**SET THEORY AND BOOLEAN ALGEBRA**:

Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse Diagram. Functions: Inverse Function Compositions of functions, Lattice and its Properties. Introduction Boolean Algebra- Sub Algebra, Direct product and homomorphism.

**UNIT-III**

**ELEMENTARY COMBINATORICS:**

Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion.

**UNIT-IV**

**RECURRENCE RELATION:**

Generating Functions, Sequences, Calculating Coefficient of generating functions, Recurrence relations. Solving recurrence relation by substitution. Generating functions and Characteristic equations (both homogeneous and non-homogeneous Recurrence Relation).

**UNIT-V**

**GRAPH THEORY:**

Representation of Graph, Directed Graph, Sub graphs, Isomorphism of Graphs, Planar Graphs, Connected Graphs, Euler and Hamiltonian circuits and their necessary and sufficient conditions for existence of Eule Circuits and Hamiltonian Circuits. (without Proof). Trees, Spanning and minimal spanning Trees, Prim's and Kruskal algorithm. Searching Algorithms of Trees - DFS, BFS.

**Text Books:**


1. Trembly J.P. &Manoha. P, Discrete Mathematical Structures with applications to computer science TMH. 2017.
2. Dr D.S. Chandrasekhara, Mathematical Foundations of computer science Prism books Pvt Ltd.2012.


**REFERENCES:**


1. Bernand Kolman, Roberty C. Busby, Sharn Cutter, Discrete Mathematical Structures, Ross, Pearson Education/PHI. 2013
2. Mallik and Sen, Discrete Mathematical Structures, Thomson. 2004.
3. J.L. Mott, A. Kandel, T.P. Baker, Discrete Mathematics for Computer Scientists & Mathematicians Prentice Hall, 1986.


Co-Po Mapping

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 1 | |
| **CO2** | 3 | 3 | - | 1 | - | - | - | - | - | - | - | - | | 1 |
| **CO3** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 1 | |
| **CO4** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | | 2 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(Autonomous)**

**II B.Tech II Semester (Common to CSE, IT, CSE (DS))**

**L T P C3 -**
**- 3**

**20ACS12 DESIGN & ANALYSIS OF ALGORITHMS**

**Course Outcomes**

After Completion of the course the student will be able to:

1. Analyze the complexity of algorithms by applying the knowledge of asymptotic notations and recurrence methods.
2. Analyze the given problem and identify appropriate algorithm design technique for problem solving.
3. Perceive and apply different algorithm design paradigms to find solutions for computing problems.
4. Apply the knowledge of NP-hard and NP-Complete complexity classes to classify decision problems.

**UNIT-I** **8hrs**

**Basics of Algorithms and Mathematics:**

What is an algorithm? Algorithm Specification, Analysis Framework, Performance Analysis: Space complexity, Time complexity.

Analysis of Algorithm: Asymptotic Notations: Big-Oh notation (O), Omega notation (Ω), Theta notation (θ ), and Little-oh notation (o), Mathematical analysis of non-Recursive and recursive Algorithms with Examples. Important Problem Types: Sorting, Searching, String processing.

**UNIT-II** ` **9hrs**

**Divide and Conquer Algorithm:**

Introduction, multiplying large Integers Problem, Binary Search, Sorting (Merge Sort, Quick Sort), Matrix Multiplication. Greedy Algorithm General Characteristics, Problem solving, Activity selection problem, Elements of Greedy Strategy, Minimum Cost Spanning trees, Prim's Algorithm, Kruskal's Algorithm. Single source shortest paths: Dijkstra's Algorithm, The Knapsack Problem, Job Scheduling Problem.

**UNIT-III** **8hrs**

**Dynamic Programming:** Introduction, General method with Examples, Multistage Graphs Transitive Closure: Warshall‟s Algorithm All Pairs Shortest Paths: Floyd's Algorithm, Optimal

Binary Search Trees, Knapsack problem, Bellman-Ford Algorithm, Travelling Sales Person problem.

**UNIT-IV** **7hrs**

Exploring Graph Introduction, Traversing Trees – Preconditioning, Undirected Graph, Directed Graph, Depth First Search ,Breath First Search, Sum of subsets problem, 0/1 The Knapsack Problem, Graph coloring, Hamiltonian cycles.

**UNIT-V**

**Backtracking** **8hrs**

Introduction, General Template The naive string-matching algorithm, The Rabin, Karp algorithm, String Matching with finite automata, The four queens' problem, The Eight queens' problem.

Introduction to NP, Completeness:

The class P and NP, Polynomial reduction, NP Completeness Problem, NP Hard Problems.

**Text Books:**

1. Ellis Horowitz, Sartaj Sahni, and Sanguthevar Rajasekaran, Fundamentals of Computer Algorithms, 2nd Edition, Universities Press, 2008.
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction to Algorithms,3rd Edition, MIT Press, 2009.
3. Introduction to the Design and Analysis of Algorithms, Anany Levitin:, 2rd Edition, 2009. Pearson.

**Reference Books:**

1. Design and Analysis of Algorithms, Parag Himanshu Dave and Himanshu Bhalachandra Dave, Pearson,2009.
2. Fundamental of Algorithms by Gills Brassard, Paul Bratley, PHI,1996.
3. Introduction to Design and Analysis of Algorithms, Anany Levitin, Pearson,2011.
4. Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronal L. Rivest, Clifford Stein, 3rd Edition, PHI.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | | | | | | | | | | | 3 | |
| CO2 | 3 | 3 | 1 | | | | | | | | | | 3 | |
| CO3 | 3 | 3 | | | | | | | | | | | 3 | |
| CO4 | 3 | 3 | | | | | | | | | | | 3 | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(Autonomous)**

## II B.Tech II Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML))

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

## 20ACS13 OPERATING SYSTEMS

## Course Outcomes:

After Completion of the course the student will be able to

1. Apply the knowledge of operating system fundamental concepts to manage the computer resources.
2. Evaluate the performance of scheduling algorithms which is best suited in a multiprogramming environment.
3. Develop an algorithm to check the resources are effectively used in an operating system's component in a shared environment
4. Analyze an operating system's components to manage the user data.

## UNIT I

## INTRODUCTION TO OS **8hrs**

**Functionality of OS** - OS Design issues - Structuring methods (monolithic, layered, modular, micro-kernel models) Overview of computer operating systems, protection and security, distributed systems, special purpose systems, operating systems structures: operating system services and systems calls, system programs, operating system structure, operating systems generation.

## UNIT II

### SCHEDULING **8hrs**

Process concepts, Cooperating processes, Inter process communication. Threads: Overview, Multithreading models, PThreads. CPU Scheduling: Basic concepts, Scheduling criteria, Algorithms, and their evaluation.

## UNIT III

### PROCESS SYNCHRONIZATION & DEADLOCK **8hrs**

Process synchronization, The critical-section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions. Deadlocks: System model, deadlock characterization, Methods for handling deadlock, deadlock prevention, detection and avoidance, recovery form deadlock.

## UNIT IV 7hrs

**MEMORY MANAGEMENT STRATEGIES**

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory: demand paging, page replacement, algorithms, allocation of frames, Thrashing case studies UNIX, Linux, Windows 100

## UNIT V 8hrs

**FILE SYSTEM INTERFACE**

File concepts, Access Methods, Directory structure, File system mounting, File sharing, protection. File System implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, Mass-storage structure: Disk structure, disk scheduling, disk management, swap-space management and disk attachment.

## Text Books:

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, Wiley (2012).

## Reference Books:

1. RamezElmasri, A Carrick, David Levine, Operating Systems, A Spiral Approach - McGrawHill Science Engineering Math (2009).

**CO-PO's Mapping:**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 1 | | | | | | | | | | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 1 | | | | | | | | 3 | 3 |
| CO3 | 3 | 2 | 1 | | | | | | | | | | 3 | 3 |
| CO4 | 3 | 2 | | | | | | | | | | | 3 | 3 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

## (AUTONOMOUS)

**II B.Tech II Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML)**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

**20AIT04 SOFTWARE ENGINEERING**

**Course Outcomes:**

After Completion of the course the student will be able to:

1. Design software requirements specifications for given problems.
2. Implement structure, object oriented analysis and design for given problems.
3. Design test cases for given problems.
4. Apply quality management concepts at the application level

**UNIT - I**

**BASIC CONCEPTS IN SOFTWARE ENGINEERING AND SOFTWARE PROJECT MANAGEMENT:** Basic concepts: abstraction versus decomposition, evolution of software engineering techniques, Software development life cycle (SDLC) models: Iterative waterfall model, Prototype model, Evolutionary model, Spiral model, RAD model, Agile models, software project management: project planning, project estimation, COCOMO, Halstead's Software Science, project scheduling, staffing, Organization and team structure, risk management, configuration management.

**UNIT - II**

**REQUIREMENTS ANALYSIS AND SPECIFICATION**: The nature of software, The Unique nature of Webapps, Software Myths, Requirements gathering and analysis, software requirements specification, Traceability, Characteristics of a Good SRS Document, IEEE 830 guidelines, representing complex requirements using decision tables and decision trees, overview of formal system development techniques, axiomatic specification, algebraic specification.

**UNIT -III**

**SOFTWARE DESIGN :**Good Software Design, Cohesion and coupling, Control Hierarchy: Layering, Control Abstraction, Depth and width, Fan-out, Fan-in, Software design approaches, object oriented vs. function oriented design. Overview of SA/SD methodology, structured analysis, Data flow diagram, Extending DFD technique to real life systems, Basic Object oriented concepts, UML Diagrams, Structured design, Detailed design, Design review, Characteristics of a good user interface, User Guidance and Online Help, Mode-based vs Mode-less Interface, Types of user interfaces, Component-based GUI development, User interface design methodology: GUI design methodology

**UNIT - IV**

**CODING AND TESTING:** Coding standards and guidelines, code review, software documentation, Testing, Black Box Testing, White Box Testing, debugging, integration testing, Program Analysis Tools, system testing, performance testing, regression testing, Testing Object Oriented Programs.

**UNIT-V**

**SOFTWARE QUALITY, RELIABILITY, AND OTHER ISSUES:** Software reliability, Statistical testing, Software quality and management, ISO 9000, SEI capability maturity model (CMM), Personal software process (PSP), Six sigma, Software quality metrics, CASE and its scope, CASE environment, CASE support in software life cycle, Characteristics of software maintenance, Software reverse engineering, Software maintenance processes model, Estimation maintenance cost. Basic issues in any reuse program, Reuse approach, Reuse at organization level.

**Text Books:**

1. Rajib Mall, “Fundamentals of Software Engineering”, 5th Edition, PHI, 2018.
2. Pressman R, “Software Engineering- Practioner Approach”, McGraw Hill.

**Reference Books:**

1. Somerville, “Software Engineering”, Pearson 2.
2. Richard Fairley, “Software Engineering Concepts”, Tata McGraw Hill.
3. JalotePankaj, “An integrated approach to Software Engineering”, Narosa

**Online Learning Resources:**

1. https://nptel.ac.in/courses/106/105/106105182/
2. http://peterindia.net/SoftwareDevelopment.html

**CO-PO's Mapping:**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 1 | | | | | | | | | | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 1 | | | | | | | | 3 | 3 |
| CO3 | 3 | 2 | 1 | | | | | | | | | | 3 | 3 |
| CO4 | 3 | 2 | | | | | | | | | | | 3 | 3 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND**

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

# (AUTONOMOUS)

## II B.Tech II Semester (Common to CSE, IT, CSE (DS))

| L | T | P | C |
|---|---|---|---|
| - | - | 3 | 1.5 |

## 20ACS14 DESIGN & ANALYSIS OF ALGORITHMS LAB

### Course Outcomes:

After Completion of the practical the student will be able to

1. Design algorithms using appropriate design techniques (brute-force, greedy, dynamic programming, etc.)
2. Apply a variety of algorithms such assorting, graph related, combinatorial, etc., in a high level language tools.
3. Analyze and compare the performance of algorithms using language features.
4. Apply and implement learned algorithm design techniques and data structures to solve real-world problems.

### LIST OF EXPERIMENTS

1. Sort a given set of elements using the Quicksort method and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versusn. The elements can be read from a file or can be generated using the random number generator.
2. Obtain the Topological ordering of vertices in a given digraph
3. Implement 0/1 Knapsack problem using Dynamic Programming
4. From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm
5. Find Minimum Cost Spanning Tree of a given undirected graph using Krushkal's algorithm.
6. Check whether a given graph is connected or not using DFS method.
7. Find Minimum Cost Spanning Tree of a given undirected graph using Prim"s algorithm.
8. Implement N Queen's problem using Backtracking.
9. Implement All-Pairs Shortest Paths problem using **Floyd's algorithm.**
10. Implement **Travelling Sales Person problem** using Dynamic programming

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | | | | | | | | | | 3 | |
| CO2 | 3 | 3 | | | 2 | | | | | | | | 3 | 2 |
| CO3 | 3 | 3 | | | | | | | | | | | 3 | |
| CO4 | 3 | 3 | 2 | 1 | | | | | | | | | 3 | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND**

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(AUTONOMOUS)**

**II B.Tech II Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML))**

| L | T | P | C |
|---|---|---|---|
| - | - | 3 | 1.5 |

**20ACS15 OPERATING SYSTEMS LAB**

## Course Outcome:

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

1. Execute the basic command in UNIX operating system and shell program.
2. Simulate the principles of CPU scheduling concepts.
3. Simulate the principles of synchronization and contiguous memory allocation technique.
4. Simulate the principle of page replacement algorithm
5. Simulate the concepts of disk scheduling algorithm

## LIST OF EXPERIMENTS

1. Explain the following system calls in UNIX operating system (fork, exec, mkdir, cat, open, date, history, clear, pwd, ls, cd)
2. Write a shell script program
   (a) To perform arithmetic operations.
   (b) To find the given number is odd or even
3. Implement the various process scheduling mechanisms such as FCFS, SJF, Priority, round – robin.
4. Implement the solution for reader – writer's problem.
5. Implement the solution for dining philosopher's problem.
6. Implement banker's algorithm.
7. Implement the first fit; best fit and worst fit file allocation strategy.
8. Write a C program to simulate page replacement algorithms a) FIFO b) LRU c) LFU
9. Write a C program to simulate disk scheduling algorithm a)FIFO b)SCAN c)CSCAN

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 1 | | | | | | | | | | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 1 | | | | | | | | 3 | 3 |
| CO3 | 3 | 2 | 1 | | | | | | | | | | 3 | 3 |
| CO4 | 3 | 2 | | | | | | | | | | | 3 | 3 |
| CO5 | | | | | | | 1 | | | | | | 1 | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND**

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

# (AUTONOMOUS)

**II B.Tech II Semester (Common to CSE, IT, CSE (DS) & CSE(AI &ML)**

| L | T | P | C |
|---|---|---|---|
| - | - | 3 | 1.5 |

**20AIT05 SOFTWARE ENGINEERING LAB**

**Course Outcomes:**

After Completion of the practical the student will be able to:

1. Acquaint with historical and modern software methodologies
2. Understand the phases of software projects and practice the activities of each phase
3. Practice clean coding
4. Take part in project management
5. Adopt skills such as distributed

**List of Experiments:**

1. Draw the Work Breakdown Structure for the system to be automated
2. Schedule all the activities and sub-activities Using the PERT/CPM charts
3. Define use cases and represent them in use-case document for all the stakeholders of the system to be automated
4. Identify and analyze all the possible risks and its risk mitigation plan for the system to be automated
5. Diagnose any risk using Ishikawa Diagram (Can be called as Fish Bone Diagram or Cause& Effect Diagram)
6. Define Complete Project plan for the system to be automated using Microsoft Project Tool
7. Define the Features, Vision, Business objectives, Business rules and stakeholders in the vision document
8. Define the functional and non-functional requirements of the system to be automated by using Use cases and document in SRS document
9. Develop a tool which can be used for quantification of all the non-functional requirements
10. Write C/Java/Python program for classifying the various types of coupling.
11. Write a C/Java/Python program for classifying the various types of cohesion.
12. Write a C/Java/Python program for object oriented metrics for design proposed by Chidamber and Kremer. (Popularly called CK metrics)
13. Draw a complete class diagram and object diagrams using Rational tools

**References:**


1. Software Engineering? A Practitioner" s Approach, Roger S. Pressman, 1996, MGH.
2. Software Engineering by Ian Sommerville, Pearson Edu, 5th edition, 1999
3. An Integrated Approach to software engineering by Pankaj Jalote , 1991 Narosa


**Online Learning Resources/Virtual Labs:**

http://vlabs.iitkgp.ac.in/se/

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | | | | | | | | | | | | 3 | |
| CO2 | 2 | 3 | | 3 | | | | 3 | | | | | 3 | |
| CO3 | 2 | 3 | | | | | | | | | | | 3 | 1 |
| CO4 | 3 | | | | | | | | | | | | | |
| CO5 | 3 | | | | | | | | | | | | | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**II B.Tech II Semester**

| L | T | P | C |
|---|---|---|---|
| 1 | 0 | 2 | 2 |

## 20AIT06 SOFTWARE DEVELOPMENT FOR PORTABLE DEVICES
## (Skill Course)

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

**CO1 :** Understand the architecture and technical challenges posed by current mobile devices and cellular wireless communications

**CO2 :** Construct applications for portable devices with well-known software development tools and Application Programming Interfaces (APIs)

**CO3 :** Understand suitable software tools and APIs for the development User Interface of a particular mobile application.

**CO4 :** Develop and design small interactive programs for mobile devices using SQLite Database

**CO5 :** Identify the location based service and telephony in android applications.

## LIST OF EXPERIMENTS

**Task-1: FAMILY GPS TRACKER APP:**
Develop the mobile app which track their family members with real time movement and they will be able to see the real time Location onmap

**Task-2: GET BANK DETAILS FROM IFSC CODE:**
Many apps such as the E-commerce app require to accept payments from their users for providing different products or services or for their users. So this app requires the users to enter bank details for payments. In this payment gateway, users are asked to add their banks IFSC code to get the details of their banks. So many apps have features inside their app that while entering the bank IFSC code the user’s bank details such as Bank address, bank city, and other common details are fetched from that IFSC code. So in this article, we will take a look at How we can get the common bank details from the IFSC code in Android.

**Task-3 TIC TAC TOE GAME:**

The Tic Tac Toe Game is based on a two-player game. Each player chooses between X and O. Player play one move at a time simultaneously. In a move, a player can choose any position from a 3×3 grid. The goal here is to get three consecutive X or O in a horizontal, vertical, or diagonal direction. There will be a single activity in this application. This activity will show a 3×3 grid. The status of the game will be displayed at the bottom

**Task-4: VIDEO CALLING ANDROID APP:**

Video Calling becomes a most demanding feature in many social media apps like WhatsApp, Instagram, Facebook, etc. Not only is this but also there some other applications available for providing only this feature to connect people all over the world with each other like Duo. Hence, this gives an idea to us about the importance of video calling.

**Task-5: FACE DETECTION ANDROID APP:**

Firebase ML KIT aims to make machine learning more accessible, by providing a range of pre-trained models that can use in the iOS and Android apps. Let's use ML Kit's Face Detection API which will identify faces in photos. Design an app that can identify faces in an image, and then display information about these faces, such as whether the person is smiling, or has their eyes closed with wonderful GUI.

**Text Books**


1. Jochen Schiller, "Mobile Communications", Addison-Wesley, Second edition, 2004.
2. Professional Android 4 Application Development, Reto Meier, WROX Press, Wiley Publishing


**Reference Books**


1. The Android Developer's Cookbook: Building Applications with the Android SDK: Building Applications with the Android SDK (Developer's Library) James Steele, Nelson, 1st Edition
2. iPhone for Programmers: An app-driven approach, Paul Dietel, Harway M Dietel, Abbey Dietel, 1st Edition.
3. https://developer.apple.com/documentation/
4. https://developer.android.com/guide
5. https://www.tutorialspoint.com/android/index.htm
6. https://www.javatpoint.com/android-tutorial

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | - |
| C02 | 3 | 3 | 1 | - | - | - | - | - | - | - | 2 | - | 2 | - |
| C03 | 3 | 2 | 3 | - | 1 | - | - | - | - | - | 2 | 3 | 2 | - |
| C04 | - | 1 | 2 | 1 | 1 | - | - | - | - | - | - | 2 | - | 1 |
| C05 | - | - | - | 1 | 1 | - | - | - | - | - | - | 1 | - | 1 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**II B.Tech - II Semester (Common to All Branches)**

| L | T | P | C |
|---|---|---|---|
| 2 | 0 | 0 | 0 |

**20AHS15 QUANTITATIVE APTITUDE AND REASONING-II**

**Course Outcomes:**

After completion of the course the student will be able to

1. Develop the thinking ability to meet the challenges in solving Logical Reasoning problems.
2. Solve campus placements aptitude papers covering Quantitative Ability and Verbal Ability.
3. Apply different placement practice techniques.

**UNIT I**
**QUANTITATIVE ABILITY III**

**UNIT II**
**QUANTITATIVE ABILITY IV**

Time Speed and Distance – Uniform and Variable speed – Conversion - Average Speed –Relative Speed – Effective speed - Problems on Trains – Stationary point and object – Moving Point and Object – Boats and Streams – Downstream and Upstream - Races and Games – Head start – Dead Heat – Escalator – Number of steps

**UNIT III**
**REASONING ABILITY II**

Syllogism – Statement and Conclusion - Data Sufficiency – Data Arrangement – Linear and Circular arrangement - Data Interpretation - Line Graph – Bar graph – Pie Chart -

**UNIT IV**
**VERBAL II**

Tense – Present Tense, Past Tense, Future Tense - Voice – Active voice, Passive voice and Active to Passive Voice Conversion Rules – Speech – Direct Speech, Indirect Speech and Direct to Indirect Speech Conversion Rules –Essay Writing – Types, Steps, Format.

**UNIT V**
**SOFT SKILL II**

Time Management - Stress Management - Team Work - Accent and Voice Communication - Interview Skills.

**Text Books:**

1. Quantitative Aptitude, Logic Reasoning & Verbal Reasoning, R S Agarwal, S.Chand Publications.
2. Quantitative Aptitude for Competitive Examinations, R S Agarwal, S.Chand Publications.

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 1 | |
| **CO2** | 1 | 2 | - | - | - | - | - | - | - | - | - | - | | 1 |
| **CO3** | 2 | - | - | - | - | - | - | - | - | - | - | - | 1 | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

## III B.Tech I Semester (Common to CSE, IT, CSE (DS), CSE (AI & ML))

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

### 20ACS16 WEB TECHNOLOGIES

**Course Outcomes:**

After Completion of the course the student will be able to:

CO1: Apply HTML Structure Elements to create web page and apply CSS to styling web pages.

CO2: Design Client-Side programs using JavaScript and Server-Side programs using PHP to construct dynamic web pages.

CO3: Understand and implement Object Oriented Programming capabilities of PHP

CO4: Apply intermediate and advanced web development practices.

**UNIT- I**

**Introduction to HTML:** HTML, HTML Syntax, Semantic Markup, Structure of HTML Documents, HTML Elements, HTML5 Semantic Structure Elements. HTML Tables and Forms, Introducing Tables, Styling Tables, Introducing Forms, Form Control Elements, Table and Form Accessibility, Micro formats.

**UNIT-II**

**Introduction to CSS:** CSS Syntax, Location of Styles, Selectors, The Cascade: How Styles Interact, The Box Model, CSS Text Styling.

**Advanced CSS:** Layout, Normal Flow, Positioning Elements, Floating Elements, Constructing Multicolumn Layouts, Approaches to CSS Layout, Responsive Design, CSS Frameworks.

**UNIT-III**

**JavaScript:** Fundamentals, Ways to JavaScript can be linked to an HTML page, Variables and data types, Conditional, Loops, Arrays, Objects, Functions, Object Prototypes, The Document Object Model (DOM), Modifying the DOM, Events, Event Types, Forms.

**JavaScript frameworks:** Node.js, Mongo DB, Angular JS.

**Extending JavaScript with jQuery:** jQuery Foundations, Event Handling in jQuery, DOM Manipulation, Effects and Animation, AJAX, Asynchronous File Transmission

**UNIT-IV**

**PHP:** PHP Tags, Comments, Variables, Data Types, and Constants, Writing to Output, printf, Program Control, Functions, Arrays and Super globals, Arrays, $GET and $POST Super global Arrays, $SERVER Array, $Files Array, Reading/Writing Files.

**PHP Classes and Objects:** Object-Oriented Overview, Classes and Objects in PHP, Object Oriented Design, Error Handling and Validation, Errors and Exceptions, PHP Error Reporting, PHP Error and Exception Handling.

**Working with Databases:** SQL, NoSQL, Database APIs, Managing a MySQL Database, Accessing MySQL in PHP.

**UNIT-V**

**Managing State:** The Problem of State in Web Applications, Passing Information via Query Strings, Passing Information via the URL Path, Cookies, Serialization, Session State, HTML5 Web Storage, Caching.

**XML Processing and Web Services:** XML Processing, JSON, Overview of Web Services. Content Management Systems, Search Engines, Social Networks and Analytics.

**TEXT BOOK:**

1. Randy Connolly, Ricardo Hoar, "Fundamentals of Web Development”, 2nd Edition, Pearson Education India, 2018.

**REFERENCE BOOKS:**

1. Robin Nixon, “Learning PHP, MySQL &JavaScript with jQuery, CSS and HTML5”, 4thEdition, O’Reilly Publications, 2015. (ISBN:978-9352130153)
2. Luke Welling, Laura Thomson, “PHP and MySQL Web Development”, 5th Edition, Pearson Education, 2016. (ISBN:978-9332582736)
3. Nicholas C Zakas, “Professional JavaScript for Web Developers”, 3rd Edition, Wrox/Wiley India, 2012. (ISBN:978-8126535088)
4. David Sawyer Mcfarland, “JavaScript & jQuery: The Missing Manual”, 1st Edition, O’Reilly/Shroff Publishers & Distributors Pvt Ltd, 2014 (ISBN: 978-9351108078)
5. Zak Ruvalcaba Anne Boehm, “Murach's HTML5 and CSS3”, 3rdEdition, Murachs/Shroff Publishers & Distributors Pvt Ltd, 2016. (ISBN:978-9352133246)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | 3 | - | - | 3 | - | - | - | - | - | - | 3 | 2 | - |
| C02 | 3 | 2 | - | - | 3 | 1 | - | - | - | 3 | - | 3 | 2 | - |
| C03 | 3 | 3 | 3 | - | - | 1 | 1 | - | - | - | - | 3 | 2 | - |
| C04 | - | - | 3 | 3 | 3 | - | - | 1 | - | - | 1 | | - | 1 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**III B.Tech I Semester (Common to CSE, IT, CSE (DS), CSE (AI & ML))**

## 20ACS17 COMPUTER NETWORKS

Course Outcomes:

After Completion of the course the student will be able to:

CO1: Describe various components and topologies of computer networks

CO2: Use the network reference model layered structure for real time applications.

CO3: Implement various routing protocols from different layers.

CO4: Design, implement and test an efficient algorithmic solution for the give problem.

CO5: Analyse network security mechanics and other issues in the application layer.

UNIT- I

Introduction: Uses of Computer Networks, Network Hardware, Network Topologies, Network Software, References Models. The Data Link Layer: Data link Layer Design Issues, Elementary Data Link Protocols, and Sliding Window Protocols.

UNIT-II

The Medium Access Control Sub layer: Channel allocation Problem, Multiple Access Protocols, Ethernet: Classic Ethernet physical layer, Ethernet MAC Sub layer Protocol, Ethernet Performance, Switched Ethernet, Fast Ethernet, Gigabit Ethernet,10-Gigabit Ethernet, Wireless LANs: The 802.11 Protocol Stack, 802.11 Physical Layer,802.11 MAC Sub layer Protocol, 802.11 Frame Structure,

UNIT-III

The Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Internetworking, Network Layer in the Internet.

UNIT-IV

The Transport Layer: Transport Service, Elements of Transport Protocols, Internet Transport Protocols: UDP, Internet Transport Protocols: TCP.

UNIT-V The Application Layer: Domain Name System, Electronic Mail. World Wide Web,

TEXT BOOK:

1. Computer Networks, Fifth Edition, Andrew S. Tanenbaum, David J Wetherall Pearson Education, 2011.

REFERENCE BOOKS:

1. Data Communications and Networking, Fifth Edition, Behrouz A. Forouzan, Tata McGraw Hill,2012.
2.Computer Networking: A Top ,Down Approach Featuring the Internet, Six Edition, James F. Kurose, K.W. Ross, Pearson Education,2013
3. Computer Communications and Networking Technologies, Michael A. Gallo, William M. Hancock, Cengage Learning,2001.

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C01** | **3** | **3** | **-** | **-** | **3** | **-** | **-** | **-** | **-** | **-** | **-** | **3** | **2** | **-** |
| **C02** | **3** | **2** | **-** | **-** | **3** | **1** | **-** | **-** | **-** | **3** | **-** | **3** | **2** | **-** |
| **C03** | **3** | **3** | **3** | **-** | **-** | **1** | **1** | **-** | **-** | **-** | **-** | **3** | **2** | **-** |
| **C04** | **-** | **-** | **3** | **3** | **3** | **-** | **-** | **1** | **-** | **-** | **1** | | **-** | **1** |
| **CO5** | | | **2** | | | | | **1** | | | | **1** | | |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.Tech I Semester**

**20AMB03 MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS**

**(Common to All Branches)**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

**Course Outcomes:**

**After the completion of the course student will be able to**

CO1: Explain the fundamental concepts and theoretical principles of the Economics

CO2: Apply economic principles for problem solving.

CO3: Identify market structures and types of business organizations.

CO4: List features, steps, merits, uses & limitations of Pay Back, ARR, NPV, PI & IRR methods of Capital Budgeting

CO5: Explain the basic concepts of book keeping and accounting, and analyze financial statements.

**UNIT–I INTRODUCTION TOMANAGERIALECONOMICS**

Managerial Economics: Definition, Nature and Scope –Demand analysis: Law of demand, Demand determinants, Elasticity of Demand: Definition, Types, Measurement and Significance –Demand forecasting methods (Survey methods, Statistical methods, Expert opinion method, Test marketing, Controlled experiments, Judgmental approach)

**UNIT–II THEORY OF PRODUCTION AND COSTANALYSIS**

Production function–Cobb Douglas Production function–Laws of Returns–Internal and External economies of scale COST ANALYSIS: Cost concepts, Fixed vs. Variable costs, Explicit vs. Implicit Costs, Out of Pocket costs Vs Imputed costs, Opportunity Cost and Sunk costs BREAK EVEN ANALYSIS: Concept of Break Even Point (BEP)–Break Even Chart – Assumptions underlying and Practical significance of BEP (Simple Problems).

**UNIT–III INTRODUCTION TO MARKETS AND BUSINESSORGANIZATIONS:**

Market structures, Types of Competition–Features of perfect competition, Monopoly, Monopolistic competition, Price-Output Determination under perfect competition and Monopoly, Types of Business organization, Features, Merits and demerits of Sole proprietorship, Partnership and Joint stock companies, Types of companies, Public enterprises, Types and Features, Changing business environment in post Liberalization scenario

**UNIT–IV CAPITALANDCAPITALBUDGETING:**

Capital and its Significance–Types of capital –Estimation of fixed and working capital requirements –Methods and sources of raising capital –Capital Budgeting Methods: Payback Method, Accounting Rate of Return (ARR), and Net Present Value (NPV) Method (Simple Problems).

**UNIT–V FINANCIAL ACCOUNTING AND FINANCIAL ANALYSISTHROUGHRATIOS:**

Double entry book keeping –Journal –Ledger –Trial Balance –Trading Account and balance sheet with simple adjustments Ratio analysis: Computation of Liquidity Ratios (Current and Quick Ratio), Activity Ratios (Inventory Turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debt-Equity Ratio and Interest Coverage Ratio) and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/ E Ratio and EPS).

**Text Books:**

1. Aryasri A.R., Managerial Economics and Financial Analysis, 4/E,TMH, 2009.
2. VarshneyR.L.andK.L.Maheswari,ManagerialEconomics,SultanChand&Sons,19/E,2009.
3. SiddiquiS.A. and Siddiqui, A.S., Managerial Economics and Financial Analysis, New Age international, 2009.

**Reference Books:**

1. Gupta R.L., Financial Accounting, Volume I, Sultan Chand &Sons, New Delhi, 2001
2. James C. Van Horne, Financial Managementpolicy,12/E,PHI,2001.
3. Joel Dean, Managerial Economics, PHI, 2001.

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | 2 | - | 2 | - | 1 | - | - | - | - | - | - | | |
| **CO2** | - | 2 | - | 2 | - | 1 | - | - | - | - | - | - | 1 | |
| **CO3** | - | - | 1 | - | - | - | 1 | - | - | - | 3 | - | | |
| **CO4** | - | 2 | 1 | 2 | - | 1 | 1 | - | - | - | 3 | - | | 1 |
| **CO5** | - | - | 1 | - | - | - | - | - | - | - | - | - | 1 | |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B. Tech I Semester**

### 20AEC31 DIGITAL LOGIC DESIGN

| L | T | P | C |
|---|---|---|---|
| **3** | **-** | **-** | **3** |

**Course outcomes:**

After completion of the course the student will be able to:

**CO1:** understand the number system and Boolean algebra.

**CO2**: Implement various Boolean expressions using logic gates.

**CO3**: Design combinational and sequential circuits for various practical applications

**CO4:** Implement LSI and MSI circuits using programmable logic devices (PLDs)

**UNIT- I NUMBER SYSTEM & BOOLEAN ALGEBRA:**

Digital systems, Binary Numbers, Octal Numbers, Hexadecimal Numbers, Number base conversions, complements of numbers, Signed Binary numbers, Binary Arithmetic: addition, subtraction, multiplication, division Binary codes. Boolean algebra – Basic definition, Basic theorems and properties, Boolean Functions, Canonical & Standard forms, other logic operations & Digital logic gates.

**UNIT-II GATE LEVEL MINIMIZATION:**

The map method, four variable K-map, five variable K-map, POS & SOP Simplification, Don't care conditions, NAND & NOR Implementation, other two-level Implementations, Exclusive-OR Function.

**UNIT- III COMBINATIONAL CIRCUITS:**

Combinational circuits, Analysis & Design procedure, Binary Adder and Subtractor, Decimal Adder, Binary Multiplier, Magnitude comparator, Decoder, Encoders, Multiplexers, De-multiplexers, Code Converters, priority encoders, Realization of Switching Functions Using PROM, PAL and PLA

**UNIT-IV SEQUNTIAL CIRCUITS:**

Sequential Circuits, Latches, Flips-Flops, Conversion of Flip Flops, Analysis of Clocked sequential circuits, State Reduction & Assignment, Design procedure, Registers & Counters –Registers, Shift Registers, Ripple Counters, Synchronous counters, Design of modulo-N Counters, Ring and Johnson Counters

**UNIT-V MEMORIES:**

Random - Access Memory, Memory Decoding, Error Detection and correction, Read - Only Memory, Programmable Logic Array(PLA), Programmable Array Logic(PAL), Sequential Programmable Devices.

**Text Books:**

1) Digital Design, 5/e, M.Morris Mano, Michael D Ciletti, PEA.

2) Fundamentals of Logic Design, 5/e, Roth, Cengage.

**Reference Books:**

1) Digital Logic and Computer Design, M.Morris Mano, PEA.

2) Digital Logic Design, Leach, Malvino, Saha, TMH.

3) Modern Digital Electronics, R.P. Jain, TMH.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | | | | | | | | | 1 | |
| CO2 | 3 | 3 | 3 | 3 | | | | | | | | | | 1 |
| CO3 | 3 | 3 | 3 | 3 | | | | | | | | | 1 | |
| CO4 | 3 | 3 | 3 | 3 | | | | | | | | | | 1 |

## SRI VENKATESWARA COLLEGE OFENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.Tech I Semester**

| | | | | | |
|---|---|---|---|---|---|
| **20AME18** | **ROBOTICS AND ARTIFICIAL INTELLIGENCE** | **L** | **T** | **P** | **C** |
| | | **3** | **-** | **-** | **3** |

**Course Outcome:**

After completion of the course the students will be able to

CO1: Demonstrate the knowledge in an application of AI, and select strategies based on application requirement.

CO2: Describe the basic concepts of robotics and its importance in the modern world and classification of robots and its end effectors for typical manufacturing industry and service sector.

CO3: Summarize the perception about robot components, actuators, sensors and machine vision.

CO4: Analyze the manipulator kinematics, dynamics for typical robots which will be used for complex operations and analyze the path planning for typical robots.

CO5: Choose a program that the robot can integrate with the manufacturing system to produce quality products with minimum cost with optimum usage of resources.

**UNIT: Introduction of AI**

Artificial Intelligence: Introduction to Artificial Intelligence (AI), History. AI techniques, LISP programming, AI and Robotics, LISP in the factory, censoring and digitizing function in machine vision, image processing and analysis, training and vision system. Intelligent Agents: Agents and Environments, the Concept of Rationality, the Nature of Environments, the Structure of Agents.

**UNIT: II Introduction to Robotics**

Automation versus Robotic technology, Laws of robot, Progressive advancements in Robots, Robot Anatomy, Classification of robots-coordinate method, control method; Specification of robots. Classification of End effectors – Tools as end effectors, Mechanical-adhesive -vacuum-magnetic-grippers.

**UNIT: III Robot Actuators, Sensors and Machine Vision**

Robot Actuators and Feedback Components: Actuators - Pneumatic and Hydraulic actuators, electric & stepper motors, comparison. Position sensors, resolvers, encoders, velocity sensors, tactile sensors, Proximity sensors, Slip Sensor, Range Sensor, Force Sensor.

Machine Vision: Camera, Frame Grabber, Sensing and Digitizing Image Data Signal Conversion, Image Storage, Lighting Techniques, Image Processing and Analysis-Data Reduction, Segmentation, Feature Extraction, Object Recognition, Other Algorithms, Applications, Inspection, Identification,
Visual Serving and Navigation.

**UNIT: IV Manipulator Kinematics and Trajectory Planning**

Mathematical representation of Robots - Position and orientation, Homogeneous transformations - D-H notation, Forward and inverse kinematics. Manipulator dynamics, Differential transformation, Jacobeans.
Trajectory planning and avoidance of obstacles, path planning, joint integrated motion – straight line motion, basics of trajectory planning, polynomial trajectory planning.

**UNIT: V Robot Applications and Programming**

Robot Application In Manufacturing: Material Transfer, Material handling, loading and unloading, Processing, spot and continuous arc welding & spray painting, Assembly and Inspection.

Robot Programming: Types, features of languages and software packages.

**TEXTBOOKS**

1. M.P. Groover, Industrial Robotics, Second Edition, New Delhi, Tata McGraw Hill, 2017.
2 R.K. Mittal & I.J.Nagrath, Robotics and Control, New Delhi, 3rdEdition, Tata McGraw Hill, 2017.
3 John J.Craig, Introduction to Robotics Mechanics and Control, Third edition, Pearson Education, 2009.

**REFERENCE BOOKS**

1 Ashitava Ghoshal, Robotics-Fundamental Concepts and Analysis', Oxford University Press, Sixth impression, 2010.
2 K.S. Fu, Robotics, New Delhi, 3rd Edition, Tata McGraw Hill, 2008.

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO-1 | 3 | | | | | | | | | | | 3 | 3 | 2 |
| CO-2 | 3 | | | | | 2 | | | | | | 3 | 3 | 2 |
| CO-3 | 3 | 3 | 3 | | | | | | | | | 3 | 3 | 2 |
| CO-4 | 3 | 3 | 3 | 3 | | | | | | | | 3 | 3 | 2 |
| CO-5 | 3 | 3 | | | 3 | | | | | | | 3 | 3 | 2 |

## SRIVENKATESWARACOLLEGEOFENGINEERING& TECHNOLOGY (AUTONOMOUS)

**III B.Tech I Semester**

### 20ACE35 INTEGRATED WASTE MANAGEMENT FOR SMART CITY

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

**Course Outcomes:**

After Completion of the course the student will be able to:

CO1: Understand the current issues and management in solid waste.
CO2: Apply basics of municipal solid waste management.
CO3: Apply various disposal methods of solid waste
CO4: Understand the construction and demolition waste management processes.
CO5: Explain management of electronic waste

**UNIT-I**

**INTRODUCTION TO SOLID WASTE MANAGEMENT:**

Municipal Solid Waste Sources; composition; generation rates Swachh Bharat Mission and Smart Cities Program, Current Issues in Solid Waste Management and Review of MSW Management Status in First List of 20Smart Cities in the Country.

**UNIT-II**

**MUNICIPALS OLID WASTE MANAGEMENT:**

Municipal Solid Waste, Characteristics and Quantities, Collection, Transportation, Segregation and Processing.

**UNIT-III**

**DISPOSAL OF MUNICIPAL SOLID WASTE:**

Land fill, Biochemical Processes and Composting, Energy Recovery from Municipal Solid Waste, Municipal Solid Waste (MSW) Rules 2016.

**UNIT-IV**

**CONSTRUCTION AND DEMOLITION(C&D) WASTE MANAGEMENT:**

Overview of C&D Waste – Sources, Effects, and Regulations, Beneficial Reuse of C&D Waste Materials.

**UNIT-V**

**ELECTRONIC WASTE (E-WASTE) MANAGEMENT:**

Sources, Effects, Issue sand Status in India and globally, controlling measures, E-Waste Management Rules 2016and Management Challenges.

**TEXTBOOKS**

1. William A Worrell and P. Aarne Veslind, “Solid Waste Engineering”, 2nd Edition Cengage Learning,2012(ISBN-13:978-1-4390-6217-3)
2. George Tchobanoglous, Hilary Theisen and Samuel A Vigil, “Integrated Solid WasteManagement”,Tata Mc Graw Hill, 1993.
3. The Central Public Health and Environmental Engineering Organization (CPHEEO),“Manualon Solid WasteManagement”,India,2016.

**REFERENCES**

1. “MunicipalSolidWasteManagementRules2016”, Central Pollution Control Board, Govt. of India, 2016.
2. “Electronic Waste Management Rules 2016”, Central Pollution Control Board, Govt. ofIndia,2016.
3. “Construction and Demolition Waste Management Rules 2016”, Ministry of Environment and Forest and Climate Change, Govt. of India, 2016.

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | - | 3 | 3 |
| CO2 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | - | 3 | 3 |
| CO3 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | - | 3 | 3 |
| CO4 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | - | 3 | 3 |
| CO5 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | - | 3 | 3 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.TECH I SEMESTER**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

### 20AIT07- DATABASE ADMINISTRATION

**COURSE OUTCOMES**

After Completion of the course the student will be able to:

CO1: Develop in-depth understanding of relational databases and skills to optimize database performance in practice.
CO2: Understand and critique on each type of databases.
CO3: Design faster algorithms in solving practical database problems.
CO4: Implement intelligent databases and various data models.
CO5: Implement intelligent Cloud Based Databases.

**UNIT I PARALLEL AND DISTRIBUTED DATABASES**

Database System Architectures: Centralized and Client-Server Architectures – Server System Architectures – Parallel Systems- Distributed Systems – Parallel Databases: I/O Parallelism – Inter and Intra Query Parallelism – Inter and Intra operation Parallelism – Design of Parallel Systems- Distributed Database Concepts - Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing – Case Studies

**UNIT II OBJECT AND OBJECT RELATIONAL DATABASES**

Concepts for Object Databases: Object Identity – Object structure – Type Constructors – Encapsulation of Operations – Methods – Persistence – Type and Class Hierarchies – Inheritance – Complex Objects – Object Database Standards, Languages and Design: ODMG Model – ODL – OQL – Object Relational and Extended – Relational Systems: Object Relational features in SQL/Oracle – Case Studies.

**UNIT III INTELLIGENT DATABASES**

Active Databases: Syntax and Semantics (Starburst, Oracle, DB2)- Taxonomy- Applications- Design Principles for Active Rules- Temporal Databases: Overview of Temporal Databases- TSQL2- Deductive Databases: Logic of Query Languages – Datalog- Recursive Rules-Syntax and Semantics of Data log Languages- Implementation of Rules and Recursion- Recursive Queries in SQL- Spatial Databases- Spatial Data Types- Spatial Relationships- Spatial Data Structures- Spatial Access Methods- Spatial DB Implementation.

**UNIT IV ADVANCED DATA MODELS**

Mobile Databases: Location and Handoff Management - Effect of Mobility on Data Management - Location Dependent Data Distribution - Mobile Transaction Models -

Concurrency Control - Transaction Commit Protocols- Multimedia Databases- Information Retrieval- Data Warehousing- Data Mining- Text Mining.

## UNIT V EMERGING TECHNOLOGIES

XML Databases: XML-Related Technologies-XML Schema- XML Query Languages- Storing XML in Databases-XML and SQL- Native XML Databases- Web Databases- Geographic Information Systems- Biological Data Management- Cloud Based Databases: Data Storage Systems on the Cloud- Cloud Storage Architectures-Cloud Data Models- Query Languages- Introduction to Big Data-Storage-Analysis.

## TEXT BOOKS:

1. Ramez Elmasri, Shamkant B. Navathe, ―Fundamentals of Database Systems‖, Sixth Edition , Pearson, 2011.
2. Thomas Cannolly and Carolyn Begg, ―Database Systems, A Practical Approach to Design, Implementation and Management‖, Fourth Edition, Pearson Education, 2008.

## REFERENCES:

1. Henry F Korth, Abraham Silberschatz, S. Sudharshan, ―Database System Concepts‖, Sixth Edition, McGraw Hill, 2011.
2. C.J.Date, A.Kannan, S.Swamynathan, ―An Introduction to Database Systems‖, Eighth Edition, Pearson Education, 2006.
3. Carlo Zaniolo, Stefano Ceri, Christos Faloutsos, Richard T.Snodgrass, V.S.Subrahmanian, Roberto Zicari, ―Advanced Database Systems‖, Morgan Kaufmann publishers,2006.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 1 | 1 |
| CO2 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 1 |
| CO3 | 2 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 | 2 |
| CO4 | 3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 1 | 2 |
| C05 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | 3 | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
**(AUTONOMOUS)**

**III B.Tech I SEM**

### 20AIT08 EFFECTIVE PROGRAMMING IN SCALA

L T P C
3 0 0 3

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1: How to develop a simple web UI
CO2: How to apply styles
CO3: How to interact with the server using a web service call
CO4: How to debug Scala code on the client side

Unit – 1

Programming Paradigms, Elements of Programming, Evaluation Strategies and Termination, Conditionals and Value Definitions, Example: square roots with Newton's method, Blocks and Lexical Scope , Tail recursion

Unit – 2

Tools Setup ,Scala 3 REPL and Worksheets, Cheat Sheet, Learning Resources,

Unit – 3

programming Paradigms, Elements of Programming,Evaluation Strategies and Termination, Square roots with Newton's method,Blocks and Lexical Scope,Tail recursion,Learning check-in,

Unit – 4

Higher-order functions, Currying, Example: Finding Fixed Points, Scala Syntax Summary, Functions and Data, More Fun With Rationals, Evaluations and Operators,

Unit – 5

Higher-order functions, Currying,Functions and data,More Fun With Rationals,Evaluations and Operators, Class hierarchies, How classes are organized, Polymorphism, Objects,

Functions as Objects, Class hierarchies, class organization, Polymorphism, Scala is functional and objected-oriented, Decomposition, Pattern Matching, Lists, Enums, Subtyping and Generics,
Variance, Decomposition, Pattern Matching, Lists, Enums, Subtyping and Generics, Variance,

**TEXT BOOKS:**

1. Programming in Scala: A comprehensive Step-by-Step Scala Programming Guide by Martin Odersky, Lex Spoon, Bill Venners

2. Scala for the Impatient by Cay Hortsmann

3. Scala in Depth by Joshua D Suereth

**REFERENCE BOOKS:**

1. Introduction to the Art of Programming Using Scala by Mark Lewis

2. Atomic Scala by Eckel and Marsh

LINK
https://www.coursera.org/learn/effective-scala#syllabus

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | - |
| C02 | 3 | 3 | 1 | - | - | - | - | - | - | - | 2 | - | 2 | - |
| C03 | 3 | 2 | 3 | - | 1 | - | - | - | - | - | 2 | 3 | 2 | - |
| C04 | - | 1 | 2 | 1 | 1 | - | - | - | - | - | - | 2 | - | 1 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

| III B.Tech I Semester (Common to CSE ,IT) | L | T | P | C |
|---|---|---|---|---|
| | 3 | - | - | 3 |

## 20ACS21 COMPUTER GRAPHICS

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:
At the end of the course the student will be able to:

CO1: Demonstrate different computer graphics applications and standards.

CO2: Design algorithms to render different geometric shapes like line, circle, and ellipse and Appreciate illumination and color models.

CO3: Apply two dimensional geometrical Analyze the issues in projecting graphical objects and identify solutions

CO4: Compare different2D, 3D viewing and clipping techniques and analyze the issues in projecting graphical objects and identify solutions

CO5: Develop solutions to problems related to computer graphics and animations by creating, rendering and projecting the Graphical object.

**UNIT-I**

**Introduction:** Basic concepts, Application areas of Computer Graphics, overview of graphics systems , Video-display devices, Raster-scan systems, Random-scan systems , Graphics monitors and workstations and input devices, graphics standards.

**UNIT-II**

**Output primitives:** Points and lines, line drawing algorithms – DDA, Bresenham's, midpoint circle Generating Algorithm-Ellipse Generating Algorithms, Filled area primitives , Scan line polygon fill algorithm, inside-outside tests, boundary-fill and flood-fill algorithms.

**UNIT-III**

**2D geometrical transforms:** Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

**2D viewing:** The viewing pipeline, Window to Viewport coordinate transformation, viewing functions, Cohen-Sutherland line clipping algorithms, Sutherland–Hodgeman polygon clipping algorithm.

**UNIT-IV**

**Three Dimensional Concepts:** 3D Display method, 3,D object representation: Polygon surfaces, Curved lines and surfaces, quadric surfaces, spline representation, Bezier curve and B-spline curves, Beizer and B-spline surfaces, Hermite curve.

**3D Geometric transformations:** Translation, rotation, scaling, reflection and shear transformations, composite transformations.

**3DViewing:** Viewing pipeline, viewing Coordinates, projections, clipping.

**UNIT-V**

**Color Model and its Applications:** RGB Color Model, YIQ Color Model, CMY Color Model, HSV Color Model.

**Computer animation:** Design of animation sequence, General Computer animation Function, Raster animations, Key-Frame Systems, Morphing, motion specifications, Direct Motion specifications, Kinematics and Dynamics.

**TEXTBOOKS**:

1. DonaldHearnandM.PaulineBaker,"ComputerGraphicsCversion",2$^{nd}$edition, PearsonEducation,1997.

2. Foley,VanDam,FeinerandHughes,"ComputerGraphicsPrinciples&practice",second editioninC,Pearson Education,1995.

**REFERENCEBOOKS:**

1. StevenHarrington,”ComputerGraphics”,TMH,1983

2. Zhigandxiang,RoyPlastock,“ComputerGraphicsSecondedition”,Schaum’soutlines,TataMc,Grawhill edition,2000.

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| CO3 | 3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| CO4 | 3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 3 |
| CO5 | 3 | 3 | 1 | 1 | 1 | - | - | - | - | - | - | - | 3 | 3 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.TECH I SEMESTER**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

### 20AIT09 INFORMATION RETRIEVAL AND WEB SEARCH

**Course Outcomes:-**

After Completion of the course the student will be able to:

CO1.Applyinformation retrieval models.
CO2. Design Web Search Engine.
CO3.Use Link Analysis.
CO4.Use Hadoop and Map Reduce.
CO5.Apply document text mining techniques.

**UNITI INTRODUCTION**

Introduction-HistoryofIR-ComponentsofIR-Issues–OpensourceSearchengineFrameworks-The impact of the web on IR - The role of artificial intelligence (AI) in IR — IR Versus Web Search –Components of a Search engine-Characterizing the web.

**UNITII INFORMATION RETRIEVAL**

Boolean and vector-space retrieval models- Term weighting - TF-IDF weighting- cosine similarity —Preprocessing– Invertedindices-efficientprocessingwithsparsevectors–LanguageModelbasedIR–ProbabilisticIR–LatentSemanticIndexing-Relevancefeedbackandqueryexpansion.

**UNITIII WEBSEARCHENGINE–INTRODUCTIONAND CRAWLING**

Web search overview, web structure, the user, paid placement, search engine optimization spam. Web size measurement – search engine optimization / spam–Web Search Architectures-crawling-meta-crawlers-FocusedCrawling-webindexes—-Near-duplicatedetection-IndexCompression-XMLretrieval.

**UNIT IV WEBSEARCH – LINKANALYSISANDSPECIALIZED SEARCH**

Link Analysis –hubs and authorities — Page Rank and HITS algorithms -Searching and Ranking —Relevance Scoring and ranking for Web — Similarity - Hadoop & Map Reduce - Evaluation - Personalized search - Collaborative filtering and content-based recommendation of documents and products – handling “invisible” Web - Snippet generation, Summarization, Question Answering, Cross-Lingual Retrieval.

**UNITV DOCUMENTTEXTMINING**

Information filtering; organization and relevance feedback — Text Mining -Text classification and clustering - Categorization algorithms: naive Bayes; decision trees; and nearest neighbor – Clustering algorithms: agglomerative clustering; k-means; expectation maximization (EM).

**TEXTBOOKS:**

1. C. Manning, P. Raghavan, and H. Schütze, Introduction to Information Retrieval, Cambridge University Press, 2008.
2. Ricardo Baeza –Yates and Berthier Ribeiro- Neto, Modern Information Retrieval: The Concepts and Technology behind Search2$^{nd}$Edition,ACMPressBooks2011.
3. Bruce Croft, Donald Metzler and Trevor Strohman, Search Engines: Information Retrieval inPractice, 1stEdition Addison Wesley, 2009.
4. Mark Levene an Introduction to Search Engines and Web Navigation, 2ndEditionWiley,2010.

**REFERENCES:**

1. Stefan Buettcher, Charles L. A. Clarke, Gordon V. Cormack, Information Retrieval: ImplementingandEvaluatingSearchEngines, TheMITPress,2010.
2. Ophir Frieder “Information Retrieval: Algorithms and Heuristics: The Information Retrieval Series “,2$^{nd}$Edition,Springer,2004.
3. Manu Konchady, “Building Search Applications: Lucene, Ling Pipe”, and First Edition, Gate MustruPublishing,2008.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | - | - | - | - | 3 | - | - | - | 1 | 2 |
| CO2 | 2 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 3 |
| CO3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 | 1 |
| CO4 | 3 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C05 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | 2 | 1 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**III B.Tech I SEMESTER (Common to IT, AI & ML)**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

## 20AIT10 HUMAN COMPUTER INTERACTION

**OUTCOMES:**
**After completion of the course, the students should be able to:**

CO1: Design effective dialog for HCI.
CO2: Design effective HCI for individuals and persons with disabilities.
CO3: Assess the importance of user feedback.
CO4: Explain the HCI implications for designing multimedia/ ecommerce/ e-learning Web sites.
CO5: Develop meaningful user interface.

### UNIT I FOUNDATIONS OF HCI

The Human: I/O channels – Memory – Reasoning and problem solving; The Computer: Devices – Memory – processing and networks; Interaction: Models – frameworks – Ergonomics – styles – elements – interactivity-Paradigms. - Case Studies

### UNITII DESIGN & SOFTWARE PROCESS

Interactive Design: Basics – process – scenarios – navigation – screen design – Iteration and prototyping. HCI in software process: Software life cycle – usability engineering – Prototyping in practice – design rationale. Design rules: principles, standards, guidelines, rules. Evaluation Techniques – Universal Design

### UNIT III MODELS AND THEORIES

HCI Models: Cognitive models: Socio-Organizational issues and stakeholder requirements – Communication and collaboration models-Hypertext, Multimedia and WWW.

### UNITIV MOBILE HCI

Mobile Ecosystem: Platforms, Application frameworks- Types of Mobile Applications: Widgets, Applications, Games- Mobile Information Architecture, Mobile 2.0, Mobile Design: Elements of Mobile Design, Tools. - Case Studies

### UNIT V WEB INTERFACE DESIGN

Designing Web Interfaces – Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow - Case Studies

**TEXT BOOKS:**

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, ―Human Computer Interaction‖, 3rd Edition, Pearson Education, 2004
2. Brian Fling, Mobile Design and Development‖, First Edition, O‘Reilly Media Inc., 2009

**REFERENCE BOOKS:**

1. Bill Scott and Theresa Neil, ―Designing Web Interfaces‖, First Edition, O‘Reilly, 2009.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | - | - | - | - | 3 | - | - | - | 1 | 2 |
| CO2 | 2 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 3 |
| CO3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 | 1 |
| CO4 | 3 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| CO5 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | 2 | 1 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**(AUTONOMOUS)**
**III B.Tech I Semester**
**(Common to CSE, IT, CSE (DS), CSE (AI & ML))**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

**20ACS18** **CRYPTOGRAPHY AND NETWORK SECURITY**
**(Professional Elective Courses-I)**

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

1. Identify different types of Attacks and interpret various cryptography techniques.
2. Select the appropriate cryptography algorithm based on the requirements and Applications.
3. Apply Hash algorithm for generating Digital signatures.

**UNIT – I** **9 hrs**

**Introduction and Mathematical Foundations:** Introduction, Overview on Modern Cryptography, Number Theory, Probability and Information theory.
**Classical Cryptosystems:** Cryptanalysis of Classical Cryptosystems, Shannon's Theory.

**UNIT – II** **9 hrs**

**Symmetric Key Ciphers:** Modern Block Ciphers - DES,AES.
**Cryptanalysis of Symmetric key Ciphers :** Linear Cryptanalysis, Differential Cryptanalysis, Other Cryptanalytic Techniques, Overview on S-Box Design Principles, Modes of Operation of Block Ciphers.

**UNIT – III** **9 hrs**

**Stream Ciphers and Pseudo randomness :** Stream Ciphers and Pseudorandom Functions.
**Hash Functions and MACs:** The Merkle Damgard Construction and Message Authentication Codes.

**UNIT – IV** **9 hrs**

**Asymmetric Key Ciphers: Construction and Cryptanalysis -** More Number Theoretic Results, The RSA Cryptosystem, Primality Testing, Factoring Algorithms, Other attacks on RSA and Semantic Security of RSA, The Discrete Logarithm Problem (DLP) and the Diffie Hellman Key Exchange Algorithm, The ElGamal Encryption Algorithm, Cryptanalysis of DLP.

**UNIT V** **9 hrs**

**Digital Signatures:** Signature schemes.
**Modern Trends in Asymmetric Key Cryptography:** Elliptic Curve Based Cryptography.
**Network Security:** Secret Sharing Schemes, A Tutorial on Network Protocols, Kerberos, Pretty Good Privacy (PGP), Secure Socket Layer (SSL), Intruders and Viruses, Firewalls.

**TEXT BOOK:**

1. Douglas Stinson, "Cryptography Theory and Practice", 2nd Edition, Chapman & Hall/CRC.
2. B. A. Forouzan, "Cryptography & Network Security", Tata Mc Graw Hill.
3. W. Stallings, "Cryptography and Network Security", Pearson Education.

**REFERENCES:**


1. Wenbo Mao, "Modern Cryptography, Theory & Practice", Pearson Education.
2. Hoffstein, Pipher, Silvermman, "An Introduction to Mathematical Cryptography", Springer.
3. J. Daemen, V. Rijmen, "The Design of Rijndael", Springer.
4. A. Joux,"Algorithmic Cryptanalysis", CRC Press.
5. S. G. Telang, "Number Theory", Tata Mc Graw Hill.
6. C. Boyd, A. Mathuria, "Protocols for Authentication and Key Establishment", Springer.
7. Matt Bishop, "Computer Security", Pearson Education.


| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C01** | **3** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **2** | **-** |
| **C02** | **3** | **3** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **2** | **-** | **2** | **-** |
| **C03** | **3** | **2** | **3** | **-** | **1** | **-** | **-** | **-** | **-** | **-** | **2** | **3** | **2** | **-** |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**(AUTONOMOUS)**

**III B.Tech I Semester (Common to CSE, IT)**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

**20ACS19** **ADVANCED COMPUTER ARCHITECTURE**
**(Professional Elective Courses-I)**

**Course Outcomes:**

After Completion of the course the student will be able to:

1. Explain the concepts of parallel computing and hardware technologies.
2. Compare and contrast the parallel architectures.
3. Explain the concepts of scalable architectures.
4. Illustrate parallel programming concepts.

## UNIT-I 10hrs

**Theory of Parallelism:** Parallel Computer Models, The State of Computing, Multiprocessors and Multicomputer ,Multifactor and SIMD Computers ,PRAM and VLSI Models, Program and Network Properties ,Conditions of Parallelism, Program Partitioning and Scheduling, Program Flow Mechanisms, System Interconnect Architectures, Principles of Scalable Performance, Performance Metrics and Measures, Parallel Processing Applications, Speedup Performance Laws, Scalability Analysis and Approaches.

## UNIT-II 10hrs

Hardware Technologies: Processors and Memory Hierarchy, Advanced Processor Technology, Superscalar and Vector Processors, Memory Hierarchy Technology, Virtual Memory Technology.

## UNIT-III 10hrs

Bus, Cache, and Shared Memory ,Bus Systems ,Cache Memory Organizations ,Shared Memory Organizations ,Sequential and Weak Consistency Models ,Pipelining and Superscalar Techniques ,Linear Pipeline Processors ,Nonlinear Pipeline Processors ,Instruction Pipeline Design ,Arithmetic Pipeline Design

## UNIT-IV 10 hrs

**Parallel and Scalable Architectures**: Multiprocessors and Multi computers ,Multiprocessor System Interconnects, Cache Coherence and Synchronization Mechanisms, Three Generations of

Multicomputer ,Message-Passing Mechanisms ,Multivector and SIMD Computers ,Vector Processing Principles ,Multivector Multiprocessors ,Compound Vector Processing ,SIMD Computer Organizations (Scalable, Multithreaded, and Dataflow Architectures, Latency-Hiding Techniques, Principles of Multithreading, Fine-Grain Multicomputer, Scalable and Multithreaded Architectures, Dataflow and Hybrid Architectures.

## UNIT-V 10hrs

**Software for parallel programming:** Parallel Models, Languages, and Compilers ,Parallel Programming Models, Parallel Languages and Compilers ,Dependence Analysis of Data Arrays ,Parallel Program Development and Environments, Synchronization and Multiprocessing Modes. Instruction and System Level Parallelism, Instruction Level Parallelism ,Computer Architecture ,Contents, Basic Design Issues ,Problem Definition ,Model of a Typical Processor ,Compiler-detected Instruction Level Parallelism ,Operand Forwarding ,Reorder Buffer, Register Renaming ,Tomasulo's Algorithm ,Branch Prediction, Limitations in Exploiting Instruction Level Parallelism ,Thread Level Parallelism.

## TEXT BOOK:

1. Kai Hwang and Naresh Jotwani, Advanced Computer Architecture (SIE): Parallelism, Scalability, Programmability, McGraw Hill Education 3/e. 2015

## REFERENCE BOOK:

1. John L. Hennessy and David A. Patterson, Computer Architecture: A quantitative approach, 5th edition, Morgan Kaufmann Elseveir, 2013

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | | | | | | | | | 2 | 2 | 2 | 2 |
| CO2 | 2 | 2 | 2 | 3 | | | | | | | 2 | 2 | 2 | 2 |
| CO3 | 3 | 2 | 2 | 2 | | | | | | | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | | 2 | | | | | | | | | 2 | 2 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**(Common to CSE, IT, CSE (DS), CSE (AI & ML))**

| | L | T | P | C |
|---|---|---|---|---|
| | - | - | 3 | 1.5 |

**20ACS25 WEB TECHNOLOGIES LAB**

## Course Outcomes:

After Completion of the practical the student will be able to:

1. Design web pages using HTML and CSS.
2. Create dynamic webpage by applying server and server side scripting languages
3. Apply database connectivity for storing and retrieving data from database through Web page

**LIST OF EXPERIMENTS**

**Week 1:**

1. Write a JavaScript to design a simple calculator to perform the following operations: sum, product, difference and quotient.

**Week 2:**

2. Write a JavaScript that calculates the squares and cubes of the numbers from 0 to 10 and outputs HTML text that displays the resulting values in an HTML table format.

**Week 3:**

3. Write a JavaScript code that displays text TEXT-GROWING with increasing font size in the interval of 100ms in RED COLOR, when the font size reaches 50pt it displays TEXTSHRINKING in BLUE color. Then the font size decreases to 5pt.

**Week 4:**

4. Develop and demonstrate a HTML5 file that includes JavaScript script that uses functions for the following problems:

   1. Parameter: A string
   2. Output: The position in the string of the left-most vowel
   3. Parameter: A number
   4. Output: The number with its digits in the reverse order

**Week 5:**

5. Design an XML document to store information about a student in SVCET College. The information must include USN, Name, and Name of the College, Programme, Year of Joining, and email id. Make up sample data for 3 students. Create a CSS style sheet and use it to display the document.

**Week 6:**

6. Write a PHP program to keep track of the number of visitors visiting the web page and to display this count of visitors, with proper headings.

**Week 7:**

7. Write a PHP program to display a digital clock which displays the current time of the server.

**Week 8:**

8. Write the PHP programs to do the following:
    1. Implement simple calculator operations.
    2. Find the transpose of a matrix.
    3. Multiplication of two matrices.
    4. Addition of two matrices.

**Week 9:**

9. Write a PHP program named states.py that declares a variable states with value "Mississippi Alabama Texas Massachusetts Kansas". Write a PHP program that does the following:
    1. Search for a word in variable states that ends in xas. Store this word in element 0 of a list named statesList.
    2. Search for a word in states that begins with k and ends in
    3. Perform a case-insensitive comparison. [Note: Passing re.Ias a second parameter to method compile performs a case-insensitive comparison.] Store this word in element1 of statesList.
    4. Search for a word in states that begins with M and ends in
    5. Store this word in element 2 of the list.
    6. Search for a word in states that ends in
    7. Store this word in element 3 of the list.

**Week 10:**

10. Write a PHP program to sort the student records which are stored in the database using selection sort.

**Week 11:**

11. Case Study Schemas (i.e., the tables and their relationships)
    1. Travel Photo Sharing Database

2. Art database schema
3. Book CRM Database

**Week 12:**

Case studies:- Practice sessions on Node.js and AngularJS.

**TEXTBOOK:**


1. Deitel and Deitel and Nieto, ―Internet and World Wide Web - How to Program‖, Prentice Hall, 5th Edition, 2011.
2. UttamK.Roy, ―Web Technologies‖, Oxford University Press, 2011.


**REFERENCES:**


1. Stephen Wynkoop and John Burke ―Running a Perfect Website‖, QUE, 2nd Edition, 1999.
2. Chris Bates, Web Programming – Building Intranet Applications, 3rd Edition, Wiley Publications, 2009.
3. Jeffrey C and Jackson, ―Web Technologies A Computer Science Perspective‖, Pearson Education, 2011.
4. Gopalan N.P. and Akilandeswari J., ―Web Technology, Prentice Hall of India, 2011


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 | 2 | - |
| C02 | 3 | 2 | - | | 3 | 1 | 1 | - | - | 3 | - | 3 | 2 | - |
| C03 | 3 | 3 | 3 | - | - | - | 1 | - | - | - | - | - | 2 | - |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**III B.Tech I Semester (Common to CSE, IT, CSE (DS), CSE (AI & ML))**

| | L | T | P | C |
|---|---|---|---|---|
| | - | - | 3 | 1.5 |

**20ACS26 COMPUTER NETWORKS LAB**

## Course Outcomes:

After Completion of the course the student will be able to:

1. Implement various routing protocols from different layers.
2. Design, implement and test an efficient algorithmic solution for the give problem
3. Use Network programming concepts in distributed applications.
4. Analyze different networking protocols and its modeling concepts to evaluate networkperformances.

**LIST OF EXPERIMENTS**

1. Implementation of the Data Link Layer Framing methods Character Stuffing and Bit stuffing.
2. Implementation of CRC polynomials, CRC 12, CRC 16 and CRC CCIP.
3. Implementation of Sliding Window Protocol Select Repeat ARQ.
4. Implementation of Dijkstra’s algorithm for Shortest Path.
5. Implementation Link State routing algorithm.
6. Program to obtain Routing table for each node using the Distance Vector Routing algorithm of a given subnet.
7. Implementation of encryption & decryption using DES algorithm.
8. Implementation of encryption & decryption mechanisms using RSA algorithm.
9. Configure Host IP, Subnet Mask and Default Gateway in a System in LAN (TCP/IP Configuration).
10. Design and analyze the performance of a set of local area networks interconnected by switches and hub.
11. Case studies: Implement transmission of ping messages/traceroute over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C01** | 3 | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| **C02** | 3 | 3 | 1 | 1 | - | - | - | - | - | - | - | - | 3 | 3 |
| **C03** | 3 | 3 | 3 | 3 | 1 | - | - | - | - | - | - | 2 | 3 | 2 |
| **C04** | - | - | 2 | 2 | 1 | - | - | - | - | - | - | 2 | 3 | - |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B. Tech - I – Semester (Common to all Branches)**

| L | T | P | C |
|---|---|---|---|
| 1 | 0 | 2 | 2 |

## 20AHS16 ADVANCED ENGLISH COMMUNICATION SKILLS

**Course Outcome:**

After Completion of the course the student will be able to:

CO1: Develop language fluency through conversational practices and demonstrate appropriate body language during communication.
CO2: Interpret and apply synonyms, antonyms, one word substitutes, prefixes and suffixes to develop vocabulary to comprehend oral and written communication.
CO3: Analyze reading and writing techniques in preparing letters, resumes and technical reports by examining and applying guessing meaning, scanning, skimming and interfering meaning.
CO4: Demonstrate ability to function effectively as an individual and as a member in diverse teams examining and applying skills in oral presentations, Interviews and Group Discussions.

**UNIT: I Inter-Personal Communication and Building Vocabulary**

Starting a conversation, Responding appropriately and relevantly, Using appropriate Body language, Role play in Different situations, Synonyms and antonyms, One-word substitutes, Prefixes and suffixes, Idioms & Phrases and Collocations.

**UNIT: II Reading Comprehension**

General vs. Local Comprehension, Reading for Facts, Guessing meanings from Context, Skimming, Scanning and inferring meaning.

**UNIT: III Writing Skills**

Structures and Presentation of different types of writing – Letter writing, Resume writing, e-correspondence and Technical report writing.

**UNIT: IV Presentation Skills**

Oral Presentations (individual or group) through JAM Sessions/Seminars/PPTs and Written Presentations through Posters/Projects/Reports/e-mails/Assignments, etc.

**UNIT: V Group Discussion And Interview Skills**

Dynamics of Group discussion, Intervention, Summarizing, Modulation of voice, Body Language, Relevance, Fluency and organization of ideas and rubrics of evaluation, Concept and Process of interviews, Pre-interview planning, Opening strategies, Answering Strategies, Interview through Tele-conference & Video-conference and Mock Interviews.

**Text Book(s)**

1. Kumar Sanjay, Pushpa Lata. English for Effective Communication, Oxford University Press, 2015.

**Reference Books**

1 Konar Nira, English Language Laboratories – A Comprehensive Manual, PHI Learning Pvt. Ltd., 2011.

**Web Links:**

1.https://www.youtube.com/watch?v=LZP1StpYEPM

2. http://nptel.ac.in/courses/121106003/

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

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**III B.Tech - I - Semester**

| | | | | | |
|---|---|---|---|---|---|
| **20AHS21** | **Indian Constitution** (Common to IT, CE, ME & ECE) | **L** | **T** | **P** | **C** |
| | | 2 | - | - | - |

**Course Outcome:**

After Completion of the course the student will be able to:

1. Demonstrate the historical background of the constitution making and its importance for building democratic India.
2. Understanding the importance of Preamble of the Indian Constitution and Parliamentary Structure.
3. Analyze decentralization of power among central, state and local self-government.
4. Examine functioning of judiciary system, fundamental rights and duties of all India Services and international institutions.

**UNIT: I Preamble and its Philosophy**

Introduction to Indian Constitution, Evolution of Indian Constitution, preamble and its philosophy.

**UNIT: II Union Legislature**

The Parliament, Parliamentary Structure, Process of Legislation, President of India - Powers and Functions; Prime Minister and Council of Ministers; Constitution Amendment Procedure.

**UNIT: III Federalism in India**

Centre-State Administrative Relationship; Governors - Powers and Functions; State Legislature - Composition and powers; Chief Ministers - Powers and Functions; The Election Commission - Powers and Functions.

**UNIT: IV Judiciary and Public Services**

The Union Judiciary - Supreme Court and High Court; Fundamental Rights and Duties All India Services - Central Civil Services -State Services - Local Services.

**UNIT: V International Participation**

Foreign Policy of India; International Institutions Influence: UNO, WTO, WHO, SAARC, International Summits: BRICS, NSS, UNEP - India's Role in International Negotiations; Environmentalism in India.

**Textbooks**


1. Briji Kishore Sharma, Introduction to the Constitution of India, Prentice Hall of India, 2005.

**Reference Books**


1 Mahendra Pal Singh, V. N. Shukla, Constitution of India, Eastern Book Company, 2011.

2 J. N. Pandey, Constitutional Law of India - Central Law Agency, 1998

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | - | 3 | 2 | - | - | - | - | - | 1 | 1 |
| CO2 | - | - | - | - | - | 3 | 3 | - | - | - | - | - | | |
| CO3 | - | - | - | - | - | 3 | 3 | - | - | - | - | - | | 1 |
| CO4 | - | - | - | - | - | 3 | 2 | 3 | - | - | - | - | 1 | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B. Tech - I Semester**

| L | T | P | C |
|---|---|---|---|
| 2 | 0 | 0 | 0 |

## 20AHS17 QUANTITATIVE APTITUDE AND REASONING – III
**(Common to IT, CE, ME & ECE )**

**Course Outcomes:**

After completion of the course the student will be able to

1. **Develop** the thinking ability to meet the challenges in solving Logical Reasoning problems.
2. **Solve** campus placements aptitude papers covering Quantitative Ability and Verbal Ability.
3. **Apply** different placement practice techniques.

**UNIT 1: QUANTITATIVE ABILITY V**

Time and Work – Equal Efficiency – Different Efficiency – Combined work – Alternate work – Partial work – Negative work - Pipes and Cistern – Simple Interest – Compound Interest - Year Zero – Difference between SI and CI – Clocks – Angle of the Clock –Minutes hand Loss or Gain – Calendars – Leap Year – Non Leap year – Odd days – Days of the week

**UNIT 2: QUANTITATIVE ABILITY VI**

Mensuration 2D – Area and Perimeter - Mensuration 3D – Volume - Total Surface area – Lateral Surface Area – Statistics- Mean - Mean Deviation – Median – Mode - Range – Variance - – Standard Deviation - Set theory

**UNIT 3: REASONING ABILITY III**

Puzzles – Cubes & Dices – Algebra – Selection Decision table – Visual reasoning - Inequalities

**UNIT 4: VERBAL III**

Vocabulary - Synonyms, Antonyms, One Word Substitution, and Spelling - Sentence Correction - Sentence Selection, Error Identification, Sentence Improvement, Sentence completion – Cloze Test, Types, Strategies - Para jumbles- Types, Strategies.

**UNIT 5: SOFT SKILLS III**

Written Communication - Listening Skills - Mentoring & Coaching - Decision Making - Competitiveness - Inspiring & Motivating.

**Text Books:**

1. Quantitative Aptitude, Logic Reasoning & Verbal Reasoning, R S Agarwal, S.Chand Publications.
2. Quantitative Aptitude for Competitive Examinations, R S Agarwal, S.Chand Publications

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 1 | |
| **CO2** | 2 | 2 | - | - | - | - | - | - | - | - | - | - | | 1 |
| **CO3** | 2 | - | - | - | - | - | - | - | - | - | - | - | | |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B. Tech I Semester**

| L | T | P | C |
|---|---|---|---|
| 2 | 0 | 0 | 0 |

### 20AHS18 FRENCH LANGUAGE

**(Common to IT, CE, ME & ECE)**

**COURSE OUTCOMES:**

After completion of the course the student will be able to:

CO1: Demonstrate basic knowledge of French language and analyze several core competencies.

CO2: Develop and improve comprehensive capabilities and apply simple phrases & sentences in real-life conversation.

CO3: Demonstrate ability to ask and answer questions about the self, personal interest, everyday life, and the immediate environment.

CO4: Apply the knowledge of tenses in making sentences for day-to-day conversations in different time frame.

**UNIT-1 INTRODUCTION&PRESENTATION:**

Conversation, Introduction, Alphabets & Accents Culture, Formal & Informal – Use of 'tu' and 'vous', Map of France: Geographical, Administrative Greeting, Presenting oneself & others, Asking & giving identity, Days of the week, Months of the year, Numbers, Nationality, Profession, Making a visiting card salutations, Gestures &Handshakes.

Grammar – Verb "appeller", 'avoir', 'etre' and Pronouns.

**UNIT-2 RENDEZVOUS:**

Conversation, approaching someone, Tele conversation, Buying a train ticket, Numbers the formula to write a post card, Culture and Life in France.

Grammar – Passe Compose, Verbs "aller", "partir", "venir", "prendre", Definite & Indefinite Articles.

**UNIT-3 AGENDA &INVITATION:**

Conversation, Time, Fixing a meeting, Alimentation, Moments of the day (from morning to night), Punctuality, Good moments of the day, Inviting someone, Accepting & Refusing Invitations, Family tree, Describing a house interior.

Grammar – Verbs “savoir”, “vouloir” , “pouvoir”, Future Proche, Pronom Tonique Consists of exercises and images to be used in the class by the students, Pronoun ‘on’, Expression of quantity with partitif article, Possessive Adjectives and Verbs “finir”, “faire,”.

**UNIT-4 VACATION & SHOPPING:**

Describing an event, Reservations at a Hotel, Describing a person, Expressing opinion, Indication of time: Depuis & pendant, Gestures: Polite & Impolite, A French vacation, Culture, Making a purchase, Choosing & Paying, Trying a dress on, Talking about weather, Understanding a Weather Bulletin, Comparison, Dress & weather, Dialogue between a client and an employee of a store and Money in everyday life in France: Parking ticket / telephone card.

Grammar – Imparfait & Passe Compose and Adjectives.

**UNIT-5 ITINERARY, EXCURSION & WEEKEND:**

Asking for & giving directions, Giving order / advice / prohibition, Reservation at a restaurant, Taking an order , Asking for bill at a Restaurant, Expression of Quantity, Alimentation: Shopping list (portions), Making Suggestion & Proposal, Going for an outing, Acceptance & Refusal of an invitation, Giving arguments: favour & against, A FrenchWeekend.
Grammar – Ordinal Verbs of Movement.

**Text Books:**

CAMPUS 1 Methode de Francais, Jacques Pecheur et Jacky Girardet, CLE International Paris2002.

La France de toujours, Nelly Mauchamp; CLEinternational.

Sans Frontireres - Vols. 1, 2, & 3 –Hachette.

**Reference Books:**

Declic 1; Jacques Balnc, Jean-Michel Cartier, Pierre Lederlion; CLEInternational.

Nouveau Sans Frontieres – Vols. 1, 2 &3.

Cours de langue et de civilisation Francaise –Hachette.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | - | - | - | - | - | - | - | 3 | 3 | - | - | 1 | |
| **CO2** | 2 | - | - | - | - | - | - | - | 3 | 3 | - | - | | 1 |
| **CO3** | 2 | - | - | - | - | - | - | - | 3 | 3 | - | - | | |
| **CO4** | 2 | - | - | - | - | - | - | - | 3 | 3 | - | - | | 1 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING &TECHNOLOGY (AUTONOMOUS)

**III B. Tech I Semester (Common to IT, CE, ME & ECE)**

| | L | T | P | C |
|---|---|---|---|---|
| **20AHS19 GERMAN LANGUAGE** | **2** | **0** | **0** | **0** |

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

**CO1:** Demonstrate fundamental knowledge to learn German language, sounds, pronunciations, sentence structures and the verb conjugation.

**CO2:** Comprehend and apply the knowledge of vocabulary and phrases in day-to-day real-life conversation.

**CO3:** Apply various sentence structures by examining the rules of grammar in speaking and writing.

**CO4:** Analyze and apply the various verb structures of English and German language effectively in professional writing.

**UNIT-1 GERMAN SOUNDS**

Vowels, consonants, diphthongs, umlaut, the nouns, gender distinctions, cases, definite and indefinite articles, conjugation of verbs, verbs with separable and inseparable prefixes, modal verbs, personal pronouns, possessive pronouns, reflexive pronouns, cases nominative, accusative and dative. Structure of sentence and categories of sentences, subordinate clause, causative and conditional sentences; A very interesting slideshow presentation is held to enlighten the students about the culture, people, and lifestyle in Germany.

**UNIT-2 SENTENCE FORMATION**

Infinite sentences, use of conjunctive-I and conjunctive-II, plus quam perfect, modal verb, Conjunction, temporal, subordinate clauses & complex sentences.

**UNIT-3 GERMAN BASIC GRAMMAR**

Verbs: Different forms, past tense and present perfect tense, adjectives and their declension, degrees of comparison; Prepositions, genitive case conjunctive. Different conjunctions (coordinating and subordinating), simple, complex and compound sentences, active and passive voice, relative pronouns.

**UNIT-4 PURPOSE OF LANGUAGE STUDY**

Pictures and perceptions, conflicts and solutions, change and the future, the purpose of the study of the German language, listening, understanding, reacting, speaking, communicating, use of language, pronunciation and intonation, reading, reading and understanding, writing, text writing, text forming, use of language, language reflection, building up the language, language comparison, culture reflection, other cultures and cultural identity.

**UNIT-5 GERMAN ADVANCED COMMUNICATION LEVEL - 1**

The significance of language study, Speaking and thinking, Self – discovery, Communication, Language Competence, Language and culture, Language changes, Connection with other areas of study, The mother language and the other languages.

**Text Books:**


1. Korbinian, Lorenz Nieder Deutschals Fremdsprache IA. Ausländer, "German Language", Perfect Paperback Publishers, 1st Edition, 1992.
2. Deutschals Fremdsprache, IB, Erganzungskurs, "German Language", Front Cover. Klett, Glossar Deutsch-Spanisch Publishers, 1st Edition, 1981.


**Reference Books:**


1. Griesbach, "Moderner Gebrauch der deutschen Sprache", Schulz Publishers, 10th Edition, 2011.
2. Anna Quick, Hermann Glaser U.A, "Intermediate German: A Grammar and workbook", Paperback, 1st Edition, 2006.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | - | - | - | - | 1 | - | - | - | 3 | - | - | 1 | |
| **CO2** | 2 | - | - | - | - | - | - | - | - | 3 | - | - | | |
| **CO3** | 3 | - | - | - | - | 2 | - | - | - | 3 | - | - | 1 | |
| **CO4** | 2 | - | - | - | - | - | - | - | - | 3 | - | - | | 1 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)**

**III B. Tech I Semester (Common to IT, CE, ME & ECE)**

# 20AHS20 JAPANESE LANGUAGE

| L | T | P | C |
|---|---|---|---|
| 2 | 0 | 0 | 0 |

**Course Outcomes:**

After Completion of the course the student will be able to:

CO1: Remember and understand Japanese alphabet and demonstrate basic structures of sentences in reading and writing.

CO2: Analyze the limitations of language by examining pronouns, verbs form, adjectives and conjunctions.

CO3: Demonstrate the skills of vocabulary and apply it to learn time and dates and express the min Japanese.

CO4: Analyze the formation of simple questions and answers in Japanese to know the Japanese culture and etiquette.

**UNIT – I**

**INTRODUCTION TO JAPANESE SYLLABLES AND GREETINGS** – Introduction of Japanese language, alphabets; Hiragana, katakana and Kanji Pronunciation, vowels and consonants. Hiragana–writing and reading; Vocabulary: 50 Nouns and20pronouns, Greetings.

**UNIT – II**

**DEMONSTRATIVE PRONOUNS, VERBS AND SENTENCE FORMATION -** Grammar:N1waN2desu, Japanese Numerals, Demonstrative pronoun-Kore, Sore, Areand Dore (This, That, Over there, which) Kono, sono, Ano and Dono (this, that, over there, which) Kochira, Sochira, Achira andDochira. thisway....) Koko, Soko, Asoko and Doko (Here, There,...location), Classification of verbs Beverb desu Present and Present negative Basic structure of sentence (Subject+Object+Verb) Katakana-reading and writing

UNIT - III

**CONJUNCTION, ADJECTIVES, VOCABULARYANDITSMEANING -** Conjunction-Ya…..nado Classification of Adjectives ‘I’and‘na’ ending Set phrase– One gaishimas Sumimasen, wakarimasen Particle–Wa,Particle-Ni‘Gaimasu’and‘Gaarimasu’for Existence of living things and non-living things Particle- Ka, Ni, Ga, Days/Months/Year/Week(Current,Previous,Next,NexttoNext);Nation,Peopleand Language Relationship of family( look and learn);Simple kanji recognition.

**UNIT - IV**

**FORMING QUESTIONS AND GIVING ANSWERS –** Classification of Question words (Dare, Nani, Itsu, Doyatte, dooshite, Ikutsu, Ikura); Classification of Te forms, Polite form of verbs.

**UNIT - V**

**EXPRESSING TIME POSITION AND DIRECTIONS** – Classification of question words(Doko,Dore, Dono, Dochira);Time expressions (Jikan), Number of hours, Number of months, calendar of a month; Visiting the departmental store, railway stations, Hospital (Byoki),office and University.

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | - | - | - | - | - | - | - | - | 3 | - | - | 1 | |
| **CO2** | 3 | - | - | - | - | - | - | - | - | 3 | - | - | | 1 |
| **CO3** | 3 | - | - | - | - | - | - | - | - | 3 | - | - | 1 | |
| **CO4** | 3 | - | - | - | - | - | - | - | - | 3 | - | - | | 1 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**(AUTONOMOUS)**

**III B.Tech II Semester (Common to CSE, IT, CSE (DS), CSE (AI & ML))**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

**20ACS28 INTERNET OF THINGS**

**Course Outcomes:**

After Completion of the course the student will be able to:

CO1: Understand the vision of IoT from the global context.

CO2: Determine the market perspective of IoT

CO3: Use of devices, gateways and data management in IoT

CO4: Designing the state of Architecture for IoT

**UNIT-I**

**Introduction And Concepts:** Introduction to Internet of Things , Physical Design of IoT, Logical Design of IoT – IoT Enabling Technologies – IoT levels & Deployment Templates.

**Domain Specific IoTs:** Introduction – Home Automation – Cities, Environment – Energy – Retail, Logistics – Agriculture, Industry, Health & Lifestyle.

**UNIT-II**

**IOT and M2M:** Introduction – M2M, Difference between IoT and M2M, SDN and NFV for IoT, IoT System management with NETCONF,YANG , Need for IoT Systems Management –Simple network Management protocol(SNMP) – Network operator requirements, NETCONF,YANG, IOT systems management with NETCONF,YANG – NETOPEER.

**UNIT-III**

**Developing Internet Of Things:** IoT Platforms Design Methodology, Introduction, IoT Design Methodology, Case Study on IoT System for Weather Monitoring – Motivation for Using Python – IoT Systems, logical Design using Python, installing Python, Python Data Types & Data Structures, Control flow, functions, Modules, Packages, File Handling, Data/Time Operations, Classes, Python Packages of Interest for IoT.

**UNIT-IV**

**Iot Physical Devices & Endpoint:** What is an IOT devices, Exemplary Devices: Raspberry Pi, About the Board, Linux on Raspberry Pi, Raspberry Pi Interfaces, Programming Raspberry Pi with Python – Other IoT Devices.

**UNIT-V**

**Iot Physical Servers & Cloud Offerings:** Introduction to Cloud Storage Models & Communication APIs, WAMP, Auto Bahn for IoT, Xively Cloud for IoT, Python Web Application Framework, Django, Designing a RESTful Web API, Amazon Web services for IoT, SkyNet IoT Messaging Platform.

**TEXT BOOK:**

1. Arshdeep Bahga, Vijay K.Madisetti, "Internet of Things", A HANDS ON APPROACH, Universities Press, 2014

**REFERENCE BOOKS:**

1. Adrian Mcewen, Hakin Cassimally, "Designing The Internet of Things", WEILEY Publications, 2015

2. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, David Boyle, Stamatis Karnouskos, "From Machine-to-Machine to the Internet of Things", Academic Press, 2014

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 2 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| CO2 | 1 | 3 | - | 2 | - | - | - | - | - | - | - | - | 2 | 3 |
| CO3 | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 3 | 3 |
| CO4 | 3 | 1 | 2 | - | - | - | - | - | - | - | - | - | 2 | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.Tech II Semester (Common to CSE, IT)**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

### 20ACS29 DATA WAREHOUSING AND DATA MINING

**Course Outcomes:**

After Completion of the course the student will be able to:

CO1: Define concepts of Data Warehousing architecture and implementation.

CO2: Apply data preprocessing techniques using modern tools.

CO3: Create association rule for mining the data in real time.

CO4: Design and deploy appropriate classification and cluster high dimensional data for better organization of data.

CO5: Evaluate various mining techniques on complex data objects.

**UNIT-I**

Data Warehousing and Business Analysis: Data warehousing Components –Building a Data warehouse –Data Warehouse Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata – reporting – Query tools and Applications – Online Analytical Processing (OLAP) – OLAP and Multidimensional Data Analysis, ETL (Extract Transform-Load).

**UNIT-II**

Data Mining: Data Mining Functionalities – Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation, Architecture Of a Typical Data Mining Systems, Classification of Data Mining Systems. Association Rule Mining: Efficient and Scalable Frequent Item set Mining Methods – Mining Various Kinds of Association Rules – Association Mining to Correlation Analysis – Constraint, Based Association Mining.

**UNIT-III**

Classification and Prediction: Issues Regarding Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction – Accuracy and Error Measures – Evaluating the Accuracy of a

Classifier or Predictor – Ensemble Methods – Model Section.

**UNIT-IV**

Cluster Analysis: Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods – Partitioning Methods – Hierarchical methods – Density, Based Methods – Grid, Based Methods – Model, Based Clustering Methods – Clustering High, Dimensional Data – Constraint, Based Cluster Analysis – Outlier Analysis.

**UNIT-V**

Mining Object, Spatial, Multimedia, Text and Web Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects – Spatial Data Mining – Multimedia Data Mining – Text Mining – Mining the World Wide Web.

**Text Books**


1. Jiawei Han, Micheline Kamber and Jian Pei"Data Mining Concepts and Techniques", Third Edition, Elsevier, 2011.


**Reference Books**


1. Alex Berson and Stephen J. Smith "Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill Edition, Tenth Reprint 2007.
2. K.P. Soman, Shyam Diwakar and V. Ajay "Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.
3. G. K. Gupta "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.
4. Pang,Ning Tan, Michael Steinbach and Vipin Kumar "Introduction to Data Mining", Pearson Education, 2007.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | 3 | 3 | 3 | - | - | - | - | - | - | - | 3 | 3 |
| CO2 | 3 | - | 3 | - | 3 | - | - | - | - | - | - | - | 3 | 3 |
| CO3 | 3 | - | - | 3 | - | - | - | - | - | - | - | - | 2 | 3 |
| CO4 | - | - | 3 | 3 | 3 | - | - | - | - | - | - | - | 3 | 2 |
| CO5 | | | | 3 | | | | | | | | | 3 | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III BTECH II SEM (Common to IT, CSE)** **L T P C**
**3 0 0 3**

### 20AIT12 OBJECT ORIENTED ANALYSIS AND DESIGN

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1: Express software design with UML diagrams
CO2: Design software applications using OO concepts.
CO3: Identify various scenarios based on software requirements
CO4: Transform UML based software design into pattern-based design using design patterns
CO5: Understand the various testing methodologies for OO software

**UNIT I UNIFIED PROCESS AND USE CASE DIAGRAMS**

Introduction to OOAD with OO Basics - Unified Process – UML diagrams – Use Case –Case study – the Next Gen POS system, Inception -Use case Modeling – Relating Use cases – include, extend and generalization –Case study Use-cases

**UNIT II STATIC UML DIAGRAMS**

Class Diagram–– Elaboration – Domain Model – Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class Hierarchies – Aggregation and Composition - Relationship between sequence diagrams and use cases – Case study Class Diagrams

**UNIT III DYNAMIC AND IMPLEMENTATION UML DIAGRAMS**

Dynamic Diagrams – UML interaction diagrams - System sequence diagram – Collaboration diagram – When to use Communication Diagrams - State machine diagram and Modeling –When to use State Diagrams - Activity diagram – When to use activity diagrams Implementation Diagrams - UML package diagram - When to use package diagrams -Component and Deployment Diagrams – Case study Component and Deployment diagrams

**UNIT IV DESIGN PATTERNS**

GRASP: Designing objects with responsibilities – Creator – Information expert – Low Coupling – High Cohesion – Controller Design Patterns – creational – factory method – structural – Bridge – Adapter – behavioural – Strategy – observer –Applying GoF design patterns – Mapping design to code

**UNIT V TESTING**

Object Oriented Methodologies – Software Quality Assurance – Impact of object orientation on Testing – Develop Test Cases and Test Plans

**TEXT BOOKS:**

1. Craig Larman, ―Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development‖, Third Edition, Pearson Education, 2005.
2. Ali Bahrami - Object Oriented Systems Development - McGraw Hill International Edition - 1999

**REFERENCES:**

1. Erich Gamma, and Richard Helm, Ralph Johnson, John Vlissides, ―Design patterns: Elements Of Reusable Object-Oriented Software‖, Addison - Wesley, 1995.
2. Martin Fowler, ―UML Distilled: A Brief Guide to the Standard Object Modeling Language, Third edition, Addison Wesley, 2003

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 1 | 1 | 2 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 |
| C02 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 3 |
| C03 | 2 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | 3 | 1 |
| C04 | 1 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 |
| C05 | 1 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

**III B.TECH II SEMESTER (Common to CSE, CSE(DS), CSE(AI & ML)**

### 20AIT13 SOFTWARE PROJECT MANAGEMENT

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1: Implement a project to manage project schedule, expenses and resources of application.

CO2: Obtain adequate knowledge about software process models and software effort estimation techniques.

CO3: Design and develop project plans to address real-world management challenges.

CO4: Aware of project management theories, tools, techniques and methods to manage the software projects at each stage of software development life cycle.

CO5: Understand modern software project management principles as a member and leader in a team to manage the projects.

**UNIT I INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT**

Manage your people – Managing project culture – Managing good people – Making good people-better – Leading good people – Implement your process – Putting a process in implementing a process – Adopting an agile process – Assessing a process – Leverage your tools – Choosing tools – Training to use tools – Leveraging tools – Use your measurements – Selecting measurements – Planning measurement – Leveraging measurement.

**UNIT II PROJECT LIFE CYCLE ANDEFFORTESTIMATION**

Software process and Process Models – Choice of Process models - Rapid Application development – Agile methods – Dynamic System Development Method – Extreme Programming– Managing interactive processes – Basics of Software estimation – Effort and Cost estimation techniques – COSMIC Full function points - COCOMO II - a Parametric Productivity Model.

**UNIT III ARTIFACTS OF THE PROCESS AND MODEL BASED SOFTWAREARCHITECTURES**

The artifact sets - Management artifacts - Engineering artifacts - Programmatic artifacts – Model based software architectures - A management perspective and technical perspective - Workflows of the process - Software process workflows - Iteration workflows – Check points of the process – Major milestones - Minor milestones - Periodic status assessments.

**UNIT IV ITERATIVE PROCESS PLANNING- PROJECT ORGANIZATIONS ANDRESPONSIBILITIES**

Work breaks down structures - Planning guidelines – The cost and schedule estimating process – The iteration planning process - Pragmatic planning -Line of business organizations - Project organizations – Evolution of organizations – Process automation-Automation building blocks-The project environment.

**UNIT V PROJECT CONTROL AND PROCESSINSTRUMENTATION**

The seven-core metrics - Management indicators - Quality indicators - Life cycle expectations - pragmatic software metrics - Metrics automation - Tailoring the process - Process Discriminates-Example.

**TEXT BOOKS:**

1. Software Project Management, 1/e, Walker Rayce, 1998, PEA, NewDelhi.
2. Software Project Management, 2/e, Henrey, 2009, Pearson Education, NewDelhi.

**REFERENCE BOOKS:**

1. Software Engineering Project Management, 2/e, Richard H. Thayer,1997, IEEE Computer Society, US.
2. Software Engineering and Management, 2/e, Shere K. D 1998, PHI, NewDelhi.
3. Software Project Management: A Concise Study, 2/e, S. A. Kelkar ,2009 , PHI, NewDelhi.
4. Software Project Management, 5/e, Hughes Cotterell, 2011, TMH,India.
5. Software Project Management, 1/e, Mohapatra S 2011, Penguin Books Ltd, London,UK.

| CO \ PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 2 | 2 |
| **CO2** | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 3 |
| **CO3** | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 | 3 |
| **CO4** | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| **CO5** | 2 | 2 | - | - | - | - | - | - | - | - | - | - | 2 | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III YEAR II SEM** **L T P C**
**3 0 0 3**

## 20AIT14 BOOTSTRAP AND ANGULAR JS

**COURSE OUTCOMES**

After Completion of the course the student will be able to:

CO1: Discuss the concepts of Angular JS.

CO2: Design the processes, and use for Angular JS Directives.

CO3: Explain the services of Angular JS.

CO4: Explain the processes of Bootstrap and Jumbotron.

CO5: Design the concepts of Bootstrap forms and menus.

**UNIT I:**
Introduction to Angular JS, JavaScript Framework, Advantages, Directives, Expressions, AngularJS Expressions vs. JavaScript Expressions, Module: Creating a module, adding a controller, adding a directive, Modules and Controllers in Files.

**UNIT II:**
Angular JS Directives: data binding, Repeating HTML Element, ng-app Directive, ng-init Directive, ng-model Directive, Create New Directives, Validate User Input, Application Status, AngularJS Data Binding, Two-way Binding, Angular JS Controller, Controller Methods, Controller, AngularJS Scope, Filters: Adding Filters to Expressions, Adding Filters to Directives.

**UNIT III:**
AngularJS Services: $http, $timeout, $interval, Select Boxes, Angular JS Tables, Angular JS HTML DOM, Angular JS Events, Angular JS Forms, Angular JS Global API.

**UNIT IV:**
Introduction to Bootstrap: History, Advantages, Downloading, BS Grid Basic, Typography, Tables, Images, Jumbotron, Page Header, Alerts.

**UNIT V:**
Bootstrap Buttons, Glyphicon, Pagination, Panels, Dropdowns, Collapse, Navbar, Forms.

**Text Book:**

1. Jake Spurlock, “Bootstrap: Responsive Web Development”, O'Reilly Media
2. Ken Willaimson, “Learning AngularJS”, O'Reilly Media

**REFERENCES:**

1. Stephen Radford, “Learning Web Development with Bootstrap and AngularJS”, Peachpit Press

   Website: http://www.w3schools.com.https://angular.io/docs
2. Angular for Enterprise-Ready Web Applications: Build and deliver production-grade and cloud-scale evergreen web apps with Angular 9 and beyond, 2nd Edition
3. Pro Angular: Build Powerful and Dynamic Web Apps

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 2 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C02 | 2 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| C03 | 3 | 3 | 2 | 3 | 1 | - | - | - | - | - | - | - | 3 | 1 |
| C04 | 3 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 2 |
| CO5 | 2 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.TECH II SEMESTER (Common to AI&ML)**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

### 20ACM04 PATTERN RECOGNITION

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1: Use Various Statistical, Syntactic and Neural Network Approaches of PR and their applications.

CO2: Explain fundamentals of Pattern Recognition using statistical models for Data Analysis.

CO3: Identify different unsupervised Learning algorithms to recognize data regularities and patterns.

CO4: Apply the Syntactic and Neural pattern recognition techniques for the measure of structural similarities in the patterns.

**UNITI: INTRODUCTIONTOPATTERNRECOGNITION**

Pattern recognition, Classification and Description, Pattern Mapping, Patterns and Feature Extraction with examples, Classifiers, Decision Regions, Boundaries, Training and learning in pattern recognition systems, Pattern recognition approaches and Comparison, Black Box approaches, Reasoning driven pattern recognition.

**UNIT II: STATISTICAL PATTERN RECOGNITION**

Introduction to Stat PR, Statistical models, Gaussian case and Class Dependence, Discriminant Functions- Uniform Densities, Classifier Performance, Risk and Errors, Introduction to Supervised learning, Parametric estimation – Maximum Likelihood Estimation, Bayesian parameter estimation, Non-parametric approaches- Density estimation, Parzen Windows.

**UNIT III: UNSUPERVISED LEARNING AND CLUSTERING**

Formulation of unsupervised problems, Unsupervised Learning Approaches, Clustering for unsupervised learning and classification, c-means algorithm, Learning Vector Quantization, Formal Characterization of General Clustering Procedures, Hierarchical clustering procedure.

**UNIT IV: SYNTACTIC PATTERN RECOGNITION**

Syntactic Pattern Recognition, Grammar based approaches, Formal Grammars, Types of Grammars, String generation as Pattern Description, Recognition by String Matching and Parsing, Cocke-Younger-Kasami (CYK) Parsing Algorithm, Augmented Transition Networks.

**UNIT V: NEURAL PATTERN RECOGNITION**

Neural Networks fundamentals, Learning in Neural networks, Physical Neural Networks, Artificial Neural Networks model, activation functions, weights- Neural Network based Pattern Associators.

**TextBooks / Reference Books**:


1. Robert J, Schalk off, “Pattern Recognition: Statistical, Structural and Neural Approaches”,JohnWiley & SonsInc., New York,Reprint2014.
2. Earl Gose, Richard John son baugh, Steve Jost, “Pattern Recognition and Image Analysis”, Prentice Hall of India Private Ltd., New Delhi – 110 001,1999.
3. DudaR.O.andHartP.E.,“PatternClassificationandSceneAnalysis”,Wiley,NewYork, 1973.
4. Christopher M. Bishop, “Neural Network for Pattern Recognition”, OxfordUniversityPress,2008.
5. Chen CH, “Handbook of Pattern Recognition and Computer Vision”, 4thEditionWorldScientificco,Pvt.Ltd.,2010.
6. http://www.byclb.com/TR/Tutorials/neural_networks


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 3 | 3 |
| **CO2** | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 3 | 2 |
| **CO3** | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 3 | 2 |
| **CO4** | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 3 | 3 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.TECH II SEMESTER**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

### 20AIT15 INTERNET PROTOCOLS

**COURSE OUTCOMES**

After Completion of the course the student will be able to:
CO1: Design a basic website using HTML and Cascading Style Sheets.
CO2: Use dynamic web page with validation using Java Script objects and by applying different event handling mechanisms.
CO3: Develop server-side programs using Servlets and JSP.
CO4: Construct simple web pages in PHP and to represent data in XML format.
CO5: Apply AJAX and web services to develop interactive web applications

**UNIT I WEBSITE BASICS, HTML 5, CSS 3, WEB 2.0**

Web Essentials**:** Clients, Servers and Communication – The Internet – Basic Internet protocols – World wide web – HTTP Request Message – HTTP Response Message – Web Clients – Web Servers – HTML5 – Tables – Lists – Image – HTML5 control elements – Semantic elements – Drag and Drop – Audio – Video controls - CSS3 – Inline, embedded and external style sheets – Rule cascading – Inheritance – Backgrounds – Border Images – Colors – Shadows – Text – Transformations – Transitions – Animations.

**UNIT II CLIENT-SIDE PROGRAMMING**

Java Script: An introduction to JavaScript–JavaScript DOM Model-Date and Objects,- Regular Expressions- Exception Handling-Validation-Built-in objects-Event Handling- DHTML with JavaScript- JSON introduction – Syntax – Function Files – Http Request – SQL.

**UNIT III SERVER-SIDE PROGRAMMING**

Servlets: Java Servlet Architecture- Servlet Life Cycle- Form GET and POST actions- Session Handling- Understanding Cookies- Installing and Configuring Apache Tomcat Web Server- DATABASE CONNECTIVITY: JDBC perspectives, JDBC program example - JSP: Understanding Java Server Pages-JSP Standard Tag Library (JSTL)-Creating HTML forms by embedding JSP code.

**UNIT IV PHP and XML**

An introduction to PHP: PHP- Using PHP- Variables- Program control- Built-in functions- Form Validation- Regular Expressions - File handling – Cookies - Connecting to Database. XML: Basic XML- Document Type Definition- XML Schema DOM and Presenting XML, XML Parsers and Validation, XSL and XSLT Transformation, News Feed (RSS and ATOM).

**UNIT V INTRODUCTION TO AJAX and WEB SERVICES**

AJAX: Ajax Client Server Architecture-XML Http Request Object-Call Back Methods; Web Services: Introduction- Java web services Basics – Creating, Publishing, Testing and Describing a Web services (WSDL)-Consuming a web service, Database Driven web service from an application –SOAP.

**TEXTBOOK:**

2. Deitel and Deitel and Nieto, ―Internet and World Wide Web - How to Program‖, Prentice Hall, 5th Edition, 2011.
2. UttamK.Roy, ―Web Technologies‖, Oxford University Press, 2011.

**REFERENCES:**

1. Stephen Wynkoop and John Burke ―Running a Perfect Website‖, QUE, 2nd Edition, 1999.
2. Chris Bates, Web Programming – Building Intranet Applications, 3rd Edition, Wiley Publications, 2009.
3. Jeffrey C and Jackson, ―Web Technologies A Computer Science Perspective‖, Pearson Education, 2011.
4. Gopalan N.P. and Akilandeswari J., ―Web Technology, Prentice Hall of India, 2011.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 1 | 2 |
| CO2 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 3 |
| CO3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 1 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C05 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 1 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.Tech II Semester**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

### 20ACS31 ETHICAL HACKING

**Course Outcomes:**

After completion of the course the student will able to do

1. Understand the basics of ethical hacking, system hacking and viruses.
2. Understand the concepts of sniffers, DOS and session hijacking.
3. Understand the fundamentals of web and wireless network hacking.
4. Apply the different types of security and cryptography techniques.

**UNIT I - Introduction to Hacking, Gathering Target, Network and Host Information**

**Defining ethical hacking – How to be ethical –** Keeping it legal - Reconnaissance - Information-gathering methodology - Social engineering – Scanning - Enumeration

**UNIT II - System Hacking, Trojans, Backdoors, Viruses, and Worms 9Hrs**

The simplest way to get passwords – Types of passwords – Cracking a password - Understanding Key loggers and Other Spyware Technologies - Escalating Privileges - Understanding Root kits - Hiding Files - Trojans and Backdoors - Viruses and Worms.

**UNIT III – Sniffers, Denial of service and Session Hijacking**

Understanding Host-to-Host Communication - How a Sniffer Works - Sniffing Countermeasures - Bypassing the Limitations of Switches - Wire shark Filters - Understanding MAC Flooding and DNS Spoofing - Denial of Service - Session Hijacking –

**UNIT IV – Web Hacking, Attacking Applications, Wireless Network Hacking**

How Web Servers Work - Types of Web Server Vulnerabilities - Web Application Vulnerabilities - Web-Based Password-Cracking Techniques - SQL Injection - Buffer Overflows - Wi-Fi and Ethernet - Authentication and Cracking Techniques - Using Wireless Sniffers to Locate SSIDs - MAC Filters and MAC Spoofing - Rogue Access Points - Wireless Hacking Techniques - Securing Wireless Networks

**UNIT V - Physical Site Security, Bypassing Network Security, Cryptography**

Components of Physical Security - Understanding Physical Security - Physical Site Security Countermeasures - What to Do After a Security Breach Occurs - Types of IDSs and Evasion Techniques - Firewall Types and Honey pot Evasion Techniques - Cryptography and Encryption Techniques - Generating Public and Private Keys - Cryptography Algorithms.

**TEXT BOOK:**

1. Kimberly Graves, Certified Ethical Hackers Study Guide, Wiley publications.

**REFERENCE BOOKS:**

1. Dafydd Stuttard, Marcus Pinto, The Web Application Hacker's Handbook, Second Edition, Wiley publications.
2. Jon Erickson, Hacking The Art of Exploitation, Second Edition, No Starch Press.
3. Michael T. Simpson, Kent Backman, and James E. Corley, Hands-On Ethical Hacking and Network Defense, Course Technology PTR A part of Cengage Learning
4. Patrick Engebretso, The Basics of Hacking and Penetration Testing Ethical Hacking and Penetration Testing Made Easy, Syngress Press

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | 1 | - | - | 2 | - | - | - | 1 | 1 | 1 |
| CO2 | 2 | - | - | - | 2 | - | - | 2 | - | - | - | 1 | 1 | 1 |
| CO3 | 2 | - | - | 1 | 2 | - | - | 2 | - | - | - | 1 | 1 | 1 |
| CO4 | 2 | - | - | 1 | 2 | - | - | 2 | - | - | - | 1 | 1 | 1 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMUS)

**III B. Tech II Semester (Common to CSE,IT)**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

### 20AEC45 MICROPROCESSORS AND INTERFACING

**Course Outcomes:**

After Completion of the course the student will be able to:

CO1: Understand the architecture of microprocessors
CO2: Write the Various ALP's of microprocessors
CO3: Design interfacing of different external peripheral devices with microprocessors and micro controllers
CO4: Develop VLSI, Embedded systems, Industrial and real time application.

**UNIT I 8086 MICROPROCESSORS**

Evolution of microprocessors, memory segmentation,8086 Architecture, register organization, Flag Register, Pin Diagram of 8086- Minimum and Maximum mode 8086 systems, Timing Diagrams for Memory Read (MR), Memory Write (MW), IO Read (IOR) and IO Write (IOW) bus cycles.

**UNIT II INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMING OF 8086**

Addressing Modes-Instruction Set, Assembler Directives-Macros and procedures, assembly language programs for addition, subtraction, multiplication, division, GCD and LCM of two numbers, Evaluation of arithmetic expressions, largest and smallest numbers in an array, sorting an array, searching for a number in an array, programs using lookup tables.

**UNIT-III INTERFACING WITH ADVANCED DEVICES**

8086 System bus structure, Memory and I/O Interfacing with 8086, Interfacing through various IC Peripheral Chips, 8257 (DMA Controller), 8259 (Interrupt Priority Control). **INTERFACING I/O PORTS AND APPLICATIONS** Keyboard display controller (8279) and interfacing to 8086,PPI 8255 – various modes of operation and interfacing to 8086, Stepper Motor interfacing, D/A &A/D converter, traffic light controller

**UNIT-IV ADVANCED MICROPROCESSORS**

Introduction to 80286, Salient Features of 80386, Real and Protected Mode Segmentation & Paging, Salient Features of Pentium, Branch Prediction and Overview of RISC Processors

**UNIT V INTRODUCTION TO MICROCONTROLLERS**

Overview of 8051 microcontroller, Architecture, I/O ports, Memory organization, addressing modes and instruction set of 8051, Simple programs.

**TEXT BOOKS:**

1. Advanced Microprocessor and Peripherals, A.K.Ray and K.M.Bhurchandi, TMH, 2000.
2. Micro Controllers, Deshmukh, Tata McGraw Hill Edition,2005.

**REFERENCE BOOKS:**

1. Micro Processors & Interfacing, Douglas V. Hall, 2007.
2. The 8088 and 8086 Micro Processors Walter, A.Triebel& Avtar Singh, 4th Edition – PHI, 2003.
3. Micro Computer System 8086/8088 Family Architecture, Programming and Design, Liu and G.A. Gibson, 2nd Edition, PHI, 1987.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 3 | | | | | | | | | 3 | 3 | 3 |
| **CO2** | 3 | 3 | 3 | 3 | | | | | | | | 3 | 3 | 3 |
| **CO3** | 3 | 3 | 3 | 3 | | | | | | | | 3 | 3 | 3 |
| **CO4** | 3 | 3 | 3 | 3 | 3 | | | | | | | 3 | 3 | 3 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

## (Autonomous)

**III B.Tech II Semester (Common to All Branches)**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

### 20AMB09 INTELLECTUAL PROPERTY RIGHTS

**COURSE OUTCOMES:**

After completion of the course, the students will be able to

CO1: Outline different types of intellectual properties.

CO2: Distinguish the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development.

CO3: Formulate designs, patent and copyright for their innovative research works.

CO4: Apply intellectual property law principles of Trademarks to real problems.

CO5: Examine ethical and professional issues which arise in the intellectual property law context.

**UNIT - I: UNDERSTANDING AND OVERVIEW OF IPR:** Introduction- meaning- nature- forms of intellectual property- types of intellectual property-industry property-International conventions.

**UNIT-II: COPYRIGHT ACT, 1957:** Meaning –Nature and object of copyright-origin and development of copyright law in India-salient features of copyright act,1957-Definitons- originality material-rights of reproduction.

**UNIT-III: TRADEMARKS ACT, 1999:** Salient features of Trademarks Act, 1999-Meaning- objectives and functions of trademark-Definition of Trademark- trademark protection- -acquisition of Trademark rights- protectable matter-trademark registration process.

**UNIT-IV: PATENT ACT, 1970:** Meaning –definition of patent-history and concept of patent law-salient features of the patent act- Definition-kinds of patents and advantages-rights and obligations of patentee- Process of obtaining a patent.

**UNIT-V: DESIGNS ACT, 2000:** Meaning –definition- Salient features of Designs-Registration of Designs- Rights granted to design holders -Infringement of Design.

**TEXT BOOKS:**

1. Narayanan, P.(Revised 2017, Reprint 2018).Patent Law. Eastern Law House.

2. Acharya, N.K. (2021). Intellectual Property Rights: Scandinavian Languages Edition.
3. Chowdhary, R., S.K. & Other. Law of Trademark, Copyrights, Patents and Designs.
4. Reddy, G.B., Intellectual Property Rights and the Law, Gogia Law Agency.
5. Holyoak, J. &Torremans, P. Intellectual Property Law.

**REFERENCES:**

1. Bouchoux, E.B. Intellectual Property Rights, Cengage Learning.
2. Ganguli, P. Intellectual Property Rights– Unleash my Knowledge Economy. Tata McGraw Hill Publishing Company Ltd.
3. Wadhera, B.L. Intellectual Property Law, Universal Publishers.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | - | - | - | - | - | - | - | - | | |
| **CO2** | - | - | - | - | - | - | 3 | - | - | - | - | - | 1 | |
| **CO3** | - | | 3 | 3 | 3 | - | - | - | - | - | - | - | | 1 |
| **CO4** | - | - | - | - | - | - | - | - | - | - | - | - | 1 | |
| **CO5** | - | - | - | - | - | - | - | 3 | - | - | - | - | | |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B. Tech II Semester**

**20AME31 OPERATIONS RESEARCH** **L T P C**

3 - - 3

**Course Outcome**:

After Completion of the course the student will be able to:

CO1: Summarize various LPP, TPP, AP, sequencing, replacement, game theory, project management, queuing models of operations Research.

CO2: Illustrate the application of OR models to identify solutions to industry.

CO3: Identify the optimum solutions with system approach to both industry and service sector.

CO4: Judge the advanced software tools for decision making with available sources for cost reduction and profit maximization with society concern.

CO5: Develop a team and play a key role in decision making with interpretation skills for all round development of organization

**UNIT: I Introduction and Liner programming**

Development – definition – characteristics and phases – types of Operations Research models – applications – limitations.

Linear Programming and its Applications: Linear Programming Problem – Graphical solution of LP Problems. Simplex method – artificial variables techniques - Two phase method,- Big M method

**UNIT: II Transportation and Assignment problems**

Transportation : Introduction – Methods of basic feasible solution, Optimality test, Degeneracy in transportation problem, unbalanced transportation Problem, -- Assignment problem – Introduction – un balanced model -- optimal solution – Hungarian method, - un-balanced assignment problems- travelling salesman problem.

**UNIT: III Replacement and waiting line problems**

Replacement : Introduction – replacement of items that deteriorate with time – when money value is not counted and counted – replacement of items that fail completely, group replacement, Waiting lines

: Introduction, single channel Poisson arrival, exponential service time with finite population and infinite population.

**UNIT: IV Simulation and Theory of Games**

Simulation Definition – types of simulation models – phases of simulation – application of simulation

– inventory and queuing problems – merits and demerits -- simulation languages.

Theory of Games: Introduction – mini, max (max, mini) – criterion and optimal strategy-- to solve the rectangular two person zero sum games, solution of rectangular games in terms of mixed strategies, solution of 2x2 games without saddle point, solution of a two person zero sum 2Xn game, Graphical method for 2Xn and nX2 games.

**UNIT: V Network Models and Project Management**

Network models - Introduction, Rules for construction and errors. Shortest route - Dijkstra's algorithm, Minimal spanning tree - Kruskal's algorithm, Maximum flow models. Project management- CPM and PERT networks.

**Text Book(s)**

1. Taha, Introduction to Operations Research, New Delhi, 8th Edition, Printice Hall International Publisher, 2016.
2 A.M. Natarajan, P. Blalsubramani & A Tamilarasi, Operatiaons Research, New Delhi. 1st Edition, Pearson Piblishers, 2005.

**Reference Books**

1 Hiller & Liberman, Introduction to Operations Research, Noida RC, 7th Edition,Tata Mc Graw Hill publication

2 R. Panneerselvam, Operations Research, New Delhi, 2nd Edition, Prentice Hall International Publisher, 2006

| | PO1 | PO2 | PO 3 | PO4 | PO5 | PO 6 | PO7 | PO8 | PO9 | PO10 | PO 11 | PO 12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | | | | | | | | | | | 3 | |
| CO2 | 3 | 3 | | | | | | | | | | | 3 | |
| CO3 | 3 | 3 | 3 | | | | | | | | | | 3 | |
| CO4 | 3 | 3 | | 3 | | | | | | | | | 3 | |
| CO5 | 3 | 3 | | | | | | | | | | | 3 | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.TECH II SEM** **LT P C**
**3 0 0 3**

## 20AIT16 GAME DESIGNING AND DEVELOPMENT

**COURSE OUTCOMES**

After Completion of the course the student will be able to:

CO1: Discuss the concepts of Game design and development.
CO2: Design the processes, and use mechanics for game development.
CO3: Explain the Core architectures of Game Programming.
CO4: Use Game programming platforms, frame works and engines.
CO5: Create interactive Games.

**UNIT I 3D GRAPHICS FOR GAME PROGRAMMING**
3D Transformations – Quaternions - 3D Modeling and Rendering - Ray Tracing – Shader Models – Lighting – Color – Texturing - Camera and Projections - Culling and Clipping - Character Animation - Physics-based Simulation - Scene Graphs.

**UNIT II GAME ENGINE DESIGN**
Game engine architecture - Engine support systems - Resources and File systems – Gameloop and real-time simulation - Human Interface devices - Collision and rigid body dynamics- Game profiling.

**UNIT III GAME PROGRAMMING**
Application layer - Game logic - Game views - managing memory - controlling the main loop - loading and caching game data - User Interface management - Game event management.

**UNIT IV GAMING PLATFORMS AND FRAMEWORKS**
2D and 3D Game development using Flash – DirectX – Java – Python – OpenGL – Game engines – Unity – DX Studio.

**UNIT V GAME DEVELOPMENT**
Developing 2D and 3D interactive games using DirectX or Python – Isometric and Tile Based Games - Puzzle games - Single Player games - Multi Player games.

**TEXT BOOKS**

1. Mike Mc Shaffrfy and David Graham, ―Game Coding Complete‖, Fourth Edition, Cengage Learning, PTR, 2012.

2. Jason Gregory, ―Game Engine Architecture‖, CRC Press / A K Peters, 2009.

**REFERENCES**

1. Ernest Adams and Andrew Rollings, ―Fundamentals of Game Design‖, Second Edition Prentice Hall / New Riders, 2009.

2. Eric Lengyel, ―Mathematics for 3D Game Programming and Computer Graphics‖, Third Edition, Course Technology PTR, 2011.

3. Jesse Schell, ―The Art of Game Design: A book of lenses‖, First Edition, CRC Press.

4. David H. Eberly, ―3D Game Engine Design, Second Edition: A Practical Approach to Real-Time Computer Graphics‖ Second Edition, Morgan Kaufmann, 2006.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| CO2 | 2 | 3 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| CO3 | 2 | 3 | 2 | 3 | 1 | - | - | - | - | - | - | - | 3 | 1 |
| CO4 | 3 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 2 |
| C05 | 3 | 2 | 1 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.TECH II SEMESTER**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

### 20AIT17 DATA EXPLORATION USING PYTHON

**COURSE OUTCOMES**

After Completion of the course the student will be able to:

CO1: Gain the basic Knowledge on advanced Python Concepts
CO2: Comprehend the various Inferential statistics
CO3: Analyze and Implement visualization techniques using Python
CO4: Apply the various machine learning techniques
CO5: Perform data analysis on the unstructured data and generate the results

**UNIT I: NUMPY AND PANDAS**

The World of Arrays with NumPy : Creating an Array – Mathematical Operations – Squaring an Array – Indexing and Slicing – Shape Manipulation. Empowering data Analysis with Pandas : The Data Structures of Pandas – Inserting and Exporting data – Data Cleaning – Data operations.

**UNIT II: INFERENTIAL STATISTICS**

Various forms of Distribution – Z-Score – P-Value – Type 1 and Type 2 Errors – Confidence Interval - Correlation – Z-Test Vs T-Test – F-Distribution – Chi-Square Distribution

**UNIT III: ADVANCED VISUALIZATION**

Controlling the line Properties of a chart – Creating multiple plots – Playing with Text – Styling your plots – Box plots – Scatter Plots with histograms – 3D Plot of a surface.

**UNIT IV: MACHINE LEARNING**

Decision Trees – Linear Regression – Logistic regression – The Naïve Baye's Classifier – The k-means clustering – Hierarchical Clustering.

**UNIT V: ANALYZING UNSTRUCTURED DATA WITHTEXTMINING**

Preprocessing data – Creating a word Cloud – Word and Sentence Tokenization – Parts of Speech Tagging – Streaming and Lemmatization. **Case Study:** Performing Sentence Analysis on World Leaders using Twitter

**TEXT BOOKS:**

1. Mastering Python for Data Science, 1/e, Samir Madhavan, 2015, Packt Publishing, Mumbai,India.
2. Hands on Data Analysis with NumPy and Pandas, 1/e, Curtis Miller, 2016, Packt Publishing, Mumbai,India.

**REFERENCE BOOKS:**

1. Hands on Data science and Python Machine Learning, 1/e, Frank Kane, 2017, Packt Publishing, Birmingham, U.K.
2. Python for Data Analysis, 2/e, Samuel Burns, Globaltech NTC, 2019, Amazon Kindle Publishing.
3. Python For Data Analysis: Master the Basics of Data Analysis in Python Using Numpy, Pandas and IPython ,Step-by-Step Tutorial for Beginners, Samuel Burns,2019.
4. Python For Data Analysis: A Step-by-Step Guide to Pandas, NumPy, and SciPy for Data Wrangling, Analysis, and Visualization, Konnor Cluster, 2019.

| PO / CO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO10 | PO11 | PO 12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | - | - | - | - | - | - | - | - | - | - | - | 1 | 2 |
| **CO2** | 3 | - | 3 | - | - | - | - | - | - | - | - | - | 2 | 1 |
| **CO3** | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 3 |
| **CO4** | 3 | - | - | 3 | - | - | - | - | - | - | - | - | 3 | 2 |
| **CO5** | 3 | 3 | - | 3 | - | - | - | - | 3 | - | - | - | 2 | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.Tech II Semester (Common to CSE, IT, CSE (DS))**

| L | T | P | C |
|---|---|---|---|
| - | - | 3 | 1.5 |

### 20ACS35 DATA WAREHOUSING AND DATA MINING LAB

**Course outcome**

After Completion of the practical the student will be able to:

CO1: Identify different attributes of credit assessment and develop a decision tree.

CO2: Derive associations from dataset and do clustering using weka.

CO3: Develop appropriate filter for classification.

**LIST OF EXPERIMENTS**

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must

involve a compromise: not too strict, and not too lenient. To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application. The German

Credit Data:

Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such data set, consisting of 1000 actual cases collected in Germany. Credit dataset (original) Excel spreadsheet version of the German credit data (Down load from web).

In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer !)

A few notes on the German dataset

• DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).

• owns telephone. German phone rates are much higher than in Canada so fewer people own telephones.

• foreign_worker. There are millions of these in Germany (many from Turrkey). It is very hard to get German citizenship if you were not born of German parents.

• There are 20 attributes used in judging a loan applicant. The goal is the classify the applicant into one of two categories, good or bad. **Sub tasks : (Turn in your answers to the following tasks)**

1. List all the categorical (or nominal) attributes and the real, valued attributes separately.
2. What attributes do you think might be crucial in making the credit assessment? Come up with some simple rules in plain English using your selected attributes.
3. One type of model that you can create is a Decision Tree , train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.
4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy?
5. Is testing on the training set as you did above a good idea? Why or Why not?
6. One approach for solving the problem encountered in the previous question is using cross validation? Describe what cross, validation is briefly. Train a Decision Tree again using cross, validation and report your results. Does your accuracy increase/decrease? Why?
7. Check to see if the data shows a bias against "foreign workers" (attribute 20),or" personal, status" (attribute 9). One way to do this (perhaps rather simpleminded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in data mining tool. Did removing these attributes have any significant effect? Discuss.
8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the Arff data file to get all the attributes initially before you start selecting the ones you want.)
9. sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifications equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross, validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?

10.Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model?

11.You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning, Explain this idea briefly. Try reduced error pruning for training your Decision Trees using crossvalidation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase?

12. (Extra Credit): How can you convert a Decision Tree into "if,then,else rules". Make up your own small Decision Tree consisting of 2,3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules , one such classifier in data mining tools is rules.PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one ! Can you predict what attribute that might be in this dataset? One R classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained bytraining a one R classifier. Rank the performance of j48, PART and one R.

13. Derive association rules from the following dataset.

| Outlook | Temperature | Humidity | Windy | Play |
|---|---|---|---|---|
| Sunny | Hot | High | False | No |
| Sunny | Hot | High | True | No |
| Overcast | Hot | High | False | Yes |
| Rainy | Mild | High | False | Yes |
| Rainy | Cool | Normal | False | Yes |
| Rainy | Cool | Normal | True | Yes |
| Overcast | Cool | Normal | True | Yes |
| Sunny | Mild | High | False | No |
| Sunny | Cool | Normal | False | Yes |
| Rainy | Mild | Normal | False | Yes |
| Sunny | Mild | Normal | False | Yes |
| Overcast | Mild | High | True | Yes |
| Overcast | Hot | Normal | False | Yes |
| Rainy | Mild | High | True | No |

14. Perform Clustering on Weather nominal data set

i. Open data mining tool and Load the data set editor. Get familiarize with the editor operations.

a. Load the weather. Nominal dataset. Use the filter, Unsupervised, instance. Remove with Values to remove all instances in which the humidity attribute has the value high. To do this, first make the field next to the Choose button show the text Remove with Values. Then click on it to get the Generic Object .Editor window, and figure out how to change the filter settings appropriately.

ii. Choosing k,means clustering algorithm for clustering use the Weather nominal data set (.arff) performs clustering with a Euclidean distance functions and visually inspect the nature of the clusters.

15. Classification: Choosing an appropriate filter for classification use the Weather nominal data set (.arff) perform classification and visualize the classification tree.

Task Resources:

Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)

- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | **2** | **2** | **3** | | | | | | | | | | **3** | **3** |
| **CO2** | **3** | **3** | **2** | **1** | **3** | | | | | | | | **3** | **3** |
| **CO3** | **3** | **3** | **2** | **2** | | | | | | | | | **3** | **3** |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III BTECH II SEM (Common to IT, CSE)**

| L | T | P | C |
|---|---|---|---|
| 0 | 0 | 3 | 1.5 |

**20AIT18 - OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY**

**COURSE OUTCOMES**

After Completion of the course the student will be able to:

CO1: Perform OO analysis and design for a given problem specification.
CO2: Identify and map basic software requirements in UML mapping.
CO3: Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns
CO4: Test the compliance of the software with the SRS.

Draw standard UML diagrams using an UML modeling tool for a given case study and map design to code and implement a 3 layered architecture. Test the developed code and validate whether the SRS is satisfied.

1. Identify a software system that needs to be developed.
2. Document the Software Requirements Specification (SRS) for the identified system.
3. Identify use cases and develop the Use Case model.
4. Identify the conceptual classes and develop a Domain Model and also derive a Class Diagram from that.
5. Using the identified scenarios, find the interaction between objects and represent them using
UML Sequence and Collaboration Diagrams
6. Draw relevant State Chart and Activity Diagrams for the same system.
7. Implement the system as per the detailed design
8. Test the software system for all the scenarios identified as per the use case diagram
9. Improve the reusability and maintainability of the software system by applying appropriate design patterns.
10. Implement the modified system and test it for various scenarios

**SUGGESTED DOMAINS FOR MINI-PROJECT:**

1. Passport automation system.
2. Book bank
3. Exam registration
4. Stock maintenance system.
5. Online course reservation system
6. Airline/Railway reservation system
7. Software personnel management system
8. Credit card processing
9. e-book management system
10. Recruitment system
11. Foreign trading system
12. Conference management system
13. BPO management system
14. Library management system
15. Student information system

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 1 | 1 | 2 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 |
| C02 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 3 |
| C03 | 2 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | 3 | 1 |
| C04 | 1 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.Tech II Semester (Common to CSE, IT, CSE (DS), CSE (AI & ML))**

| L | T | P | C |
|---|---|---|---|
| 0 | 0 | 3 | 1.5 |

## 20ACS37 Internet of Things (IOT) Lab

**Course Outcomes:**

After Completion of the practical the student will be able to:

CO1. Implement the technology that enables IoT.
CO2. Work with Hardware and software required to design and build IoT
CO3. Interface with sensors and actuators, other IoT devices, and cloud servers
CO4. Design and Develop program mobile computing device to access IoT data from cloud and to interact with devices.

**LIST OF EXPERIMENTS**

1 Connect Arduino board and glow LED, Read analog and digital sensors such as relay, temperature, Humidity.

2 Load the OS in Raspberry pi,

3 Interface with Bluetooth and transmit sensor data to other node

4 Interface with Zigbee and transmit sensor data to other node

5 Interface with 6LoWPAN and transmit sensor data to other node

6 Store sensor data in cloud

7 Mobile app to display cloud data

8 Measure the light intensity in the room and output data to the web API

9 Control your home power outlet from anywhere using raspberry pi, zigbee and arduino

10 Build a web based application to automate door that unlocks itself using facial recognition.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 1 | 1 | 2 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 |
| C02 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 3 |
| C03 | 2 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | 3 | 1 |
| C04 | 1 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.Tech II Semester**

| L | T | P | C |
|---|---|---|---|
| 1 | 0 | 2 | 2 |

## 20AIT19 INTRODUCTION TO PROGRAMMING AND ANIMATION WITH ALICE (Skill Course)

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

**CO1 :** Understand the overview of Alice and moving objects controls

**CO2 :** Construct and designing the storyboard

**CO3 :** Understand the object movement with different orientations

**CO4 :** Understanding the Practicing Random Numbers and Variables

**CO5 :** Identify the Guessing Game with arrays

### LIST OF EXPERIMENTS

1. Adding Objects to a Scene
2. Moving Objects Around: Controls, Keys, and One-shot (Mac version
3. Build a Simple World
4. More Control and Comparing Instructions
5. Implementing the Storyboard
6. Object Control Document
7. How Objects and Parts Turn and Roll
8. BunnyHop Multiple Ways

**TEXT BOOK:**

1. ALICE 3 IN ACTION: COMPUTING THROUGH ANIMATION", Second Edition by Joel Adams Cengage Learning, 15-Jan-2014

2.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C01** | **3** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **2** | **-** |
| **C02** | **3** | **3** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **2** | **-** | **2** | **-** |
| **C03** | **3** | **2** | **3** | **-** | **1** | **-** | **-** | **-** | **-** | **-** | **2** | **3** | **2** | **-** |
| **C04** | **-** | **1** | **2** | **1** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **2** | **-** | **1** |
| **C05** | **-** | **-** | **-** | **1** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **1** | **-** | **1** |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B. Tech II Semester**

**20AHS23 Essence of Indian Traditional Knowledge**

| L | T | P | C |
|---|---|---|---|
| 2 | - | - | - |

**Course Outcome:**

After Completion of the course the student will be able to:

CO1: Identify various aspects of Traditional knowledge and its importance.

CO2: Explain briefly to understand the needs and importance of protecting traditional knowledge.

CO3: Analyze the various systems, concepts and strategies of traditional knowledge.

CO4: Apply the concepts of traditional knowledge in different sectors.

**UNIT: I Introduction To Traditional Knowledge**

Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, Indigenous Knowledge (IK), characteristics, traditional knowledge vis-a-vis indigenous knowledge, traditional knowledge Vs western knowledge.

**UNIT: II Protection of Traditional Knowledge**

The need for protecting traditional knowledge Significance of TK Protection, value of TK in global economy, Role of Government to harness TK.

**UNIT: III Legal Framework And Traditional Knowledge**

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmer's Rights Act, 2001 (PPVFR Act); The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016.

**UNIT: IV Traditional Knowledge And Intellectual Property**

Systems of traditional knowledge protection, Legal concepts for the protection of traditional knowledge, Patents and traditional knowledge, Strategies to increase protection of traditional Knowledge.

**UNIT: V Traditional Knowledge In Different Sectors**

Traditional knowledge and engineering, Traditional medicine system, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK.

**Text Book(s)**

1. Traditional Knowledge System in India, by Amit Jha, 2009.

**Reference Books**

1 Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002.

2 Knowledge Traditions and Practices of India" Kapil Kapoor, Michel Danino

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 2 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C02 | 2 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| C03 | 3 | 3 | 2 | 3 | 1 | - | - | - | - | - | - | - | 3 | 1 |
| C04 | 3 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

## (Autonomous)

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

**IV B.Tech I Semester**

**20AMB04 CREATIVITY AND INNOVATION (Common to All Branches)**

**Course Outcomes:**

After the completion of the course student will be able to

CO1: Explain innovation and creativity management from the perspective of obtaining a sustainable competitive advantage and integrating innovation into the business strategy.

CO2: Explain the attributes of successful innovation strategies including an in-depth understanding of the dynamics of innovation

CO3: Identify the role that innovation plays in the competitive dynamics of industries and how these innovations affect society.

CO4: Explain the factors and drivers that predict creativity and innovation of individuals, groups, and organizations

CO5: Design a creative business concept and develop a business plan.

**Unit I: Creativity:** Concept - Convergent and Divergent Thinking -Creative Intelligence - Enhancing Creativity Intelligence -Determinants of Creativity - Creativity Process - Roots of Human Creativity - Biological, Mental, Spiritual and Social -Forms of Creativity - Essence, Elaborative and Expressive -Existential, Entrepreneurial and Empowerment.

**Unit II: Creative Personality:** Creative Personality Traits Congenial to Creativity - Motivation and Creativity - Strategies for changing Motivation - Creativogenic Environment - Formative Environment and Creativity - Adult Environment - Environmental Stimulants - Blocks to Creativity- Strategies for unblocking Creativity.

**Unit III: Organizational Creativity:** Creative Manager - Techniques of Creative Problem Solving -Creative Encounters and Creative Teams - Perpetual Creative Organizations - Creative Management Practices – Human Resource Management, Marketing Management, Management of Operations, Management of Product Design and Growth Strategies-Issues and Approaches to the Design of Creative Organizations Policy frameworks - Organizational Design for Sustained Creativity - Mechanism for Stimulating Organizational Creativity - Creative Diagnosing - Creative Societies - Necessity Model of a Creative Society

**Unit IV: Management of Innovation:** Nature of Innovation- Concept of Innovation- Historic Retrospective-Typology of Innovations-Innovation Process- Macroeconomic View of Innovation Approaches to Innovations-Assumptions and Barriers to Innovations-Innovation Sources, - Technological Innovations and their Management-Training for Innovation - Management of Innovation-Agents of Innovation -Skills for Sponsoring Innovation.

**Unit V: Innovation & Entrepreneurship:** Concept of Entrepreneurship- Entrepreneurial opportunities, attitude, traits and tendencies-Design of a Successful Innovative Entrepreneurship-Idea generation & Prototype Development- Social Innovation and Entrepreneurship-Intellectual Property Right (IPR)-Commercialization of Innovations-Startup and Venture development-Pre-incubation and Incubation Stages-Govt. Schemes and funding support to ideas, innovations, and startup-Current trends, development and general awareness on Innovation and startup.

**Text Books:**

1. Kandwalla, P. N. (2004). Lifelong creativity : an unending quest. Tata Mcgraw-Hill..
2. Khandwalla, P. N. (2022). Corporate Creativity: The Winning Edge (1st ed.). Mc Graw Hill India.
3. Dr. C.S.G. Krishnamacharyulu & Dr. Lalitha Ramakrishnan (2010) - Innovation Management, Himalaya Publishing House, Edition: 2, 2010

**Reference Books:**

1. Rastogi, P. N. (2009). Management of technology and innovation: Competing through technological excellence. SAGE Publishing India.
2. Plucker, J. A. (2021). Creativity and innovation: Theory, research, and Practice. Routledge.

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | | 2 |
| **CO2** | - | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 1 | |
| **CO3** | - | - | 3 | - | - | 3 | 3 | - | - | - | - | - | | |
| **CO4** | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | | 1 |
| **CO5** | - | - | 3 | - | 3 | - | - | - | - | - | - | - | | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(Autonomous)**

**IV B.Tech I Semester**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

## 20AMB05 LEADERSHIP ESSENTIALS

**Course Outcomes:**
After the completion of course the student will be able to:

1. Identify the concepts and theories of leadership and analyze its relevance to the organizations.
2. Analyze various sources of power, politics and conflict management.
3. Adapt theories of leadership to cases and contexts in organization.
4. Interpret change, sustainable development and implications of cultural factors in organizations.
5. Develop leadership potential and practices in organizations.

**Unit I- Overview and Introduction of Leadership:** concepts and functions of leadership; Leadership, Role and Functions of a Leader, Leadership Motives Characteristics of an Effective Leader, Leadership as a Process - the Complexities of Leadership - Effective Leadership Behaviors and Attitudes –Emerging Approaches of leadership.

**Unit II- Leadership and Power:** Sources of Power, The link between Politics, Power and Conflict, Power and Conflict; Coercion, Trait Approach, Ohio State Leadership Study, The University of Michigan Study, Blake and Mouton's Managerial Grid.

**Unit III- Leadership theories and styles:** Contingency Theories of Leadership -, The Path-Goal Theory, Transactional Leadership Style Charismatic Leadership. Servant Leadership, Leadership Ethics.

**Unit IV- Fostering Organizational Culture and Climate:** Vision Building; Developing Strategic Thinking; strategies in developing a culture conducive to change; handling change; Cultural Factors Influencing Leadership Practice.

**Unit V- Developing Future Leaders:** Strategic Leadership Competencies; 360º Leadership Assessment; The Myers–Briggs Type Indicator (MBTI); developing global leaders in organization.

**Textbooks:**


1. Peter Guy Northouse. (2021). Introduction to leadership : concepts and practice (5th ed.). Sage.
2. Humphrey, R. H. (2014). Effective leadership : theory, cases, and applications. Sage.

**References Books:**


1. Bratton, J., Grint, K., & Nelson, D. L. (2005). Organizational leadership. Thomson/South-Western.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | - | - | - | - | - | - | - | - | | |
| **CO2** | - | - | - | - | - | - | - | - | 3 | - | - | - | | |
| **CO3** | - | - | - | - | - | - | - | - | 3 | - | - | - | | |
| **CO4** | - | - | - | - | - | 3 | 3 | - | 3 | 3 | - | - | | |
| **CO5** | - | - | - | - | - | - | - | - | 3 | 3 | - | - | | |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

## (Autonomous)

**IV B.Tech I Semester**

| L | T | P | C |
|---|---|---|---|
| 3 | | | 3 |

### 20AMB06 LAW FOR ENGINEERS (Common to All Branches)

**Course Outcomes:**

After the completion of course the student will be able to:

CO1: Explain the essential principles of the law relevant to engineering practice

CO2: Apply the relevant provisions of contract law

CO3: Use effective contract laws for decision making and problem-solving techniques in different scenarios

CO4: Recognize and explore key legal requirements for engineering including health & safety, privacy, and professional indemnity.

CO5: Discuss about the industrial dispute settlement mechanism

**UNIT- I: THE NATURE AND SOURCES OF LAW:** Definition and nature of law, definition law and morality, classification of law, Overview of Business laws in India – Sources of business law.

**UNIT- II: LAW OF CONTRACT:** Contract- Essential features of a valid contract – Performance of a contract – Breach of contract and its remedies.

**UNIT- III: SPECIAL CONTRACTS:** Quasi Contracts – Contingent Contracts – Indemnity and Guarantee – Contract of Agency – Bailment and Pledge.

**UNIT- IV: LAW OF TORT:** Definition of Tort, Fundamental Purpose Development of Law of Torts-Specific Torts, Negligence, Nervous Shock, Nuisance, Trespass, Defamation False Imprisonment and Malicious Prosecution Purpose.

**UNIT- V INDUSTRIAL DISPUTE & SETTLEMENT MECHANISM:** Employee Grievances - Collective Bargaining- Industrial Disputes and Resolution Mechanism; **Overview on IPR.**

**Text Books:**


1. Kapoor, N. D. (1983). Elements of mercantile law: including company law and industrial law. Sultan Chand & Sons.
2. Kunwar Arora, Vibha Arora. (2017). Law for Engineers. Central Law Publications.

**Reference Books:**


1. Gulshan, S. S. (2009). Business law. Excel Books.
2. Mulheron, R. (2020). Principles of Tort Law. Cambridge University Press.


| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | 3 | 3 | - | - | - | - | - | - | - | - | - | | 2 |
| **CO2** | - | 3 | 3 | - | - | - | - | - | - | - | - | - | 1 | |
| **CO3** | - | 3 | 3 | - | - | - | - | - | - | - | - | - | | |
| **CO4** | - | 3 | 3 | - | - | - | - | - | - | - | - | - | | 1 |
| **CO5** | - | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

## (Autonomous)

**IV B.Tech I Semester**

| L | T | P | C |
|---|---|---|---|
| 3 | | | 3 |

**20AMB07 ENTREPRENEURSHIP ESSENTIALS (Common to All Branches)**

**COURSE OUTCOMES**

After completion of the course, the students will be able to

1. Explain the Fundamentals and specifics of Entrepreneurship.
2. Apply theoretical concepts in developing an idea and startup a new technology-based company.
3. Prepare marketing and financial plans that are viable in nature.
4 Apply marketing research methods and tools to forecast and to analyze the trend.
5. Develop innovative business solutions with a holistic perspective from concept to reality.

**UNIT-I: BASIC ENTREPRENEURSHIP:** Entrepreneurial traits, true motivation & leadership, understanding of Entrepreneurial process, understanding of personal aspirations, Entrepreneurial personality development, Entrepreneurial communication, Entrepreneurship in Indian Scenario, Future prospects in India and emerging economies.

**UNIT-II: MARKETING AND MARKET RESEARCH:** Market dynamics, Market segmentations and creation of derivatives, Marketing Research methodologies, trend, assessment, analysis and forecasting, structural aspects of market. Identification of overall market, addressable market and serviceable market for product and services.

**UNIT-III: ENGINEERING DESIGN PROCESS:** Introduction to Engineering Design Process; Design Approaches - Forward and Reverse Engineering; Reverse Engineering Process – Definition and goal of Reverse engineering (RE); Theory of inventive problem solving (TRIZ): Fundamentals, methods and techniques, inventive design strategies and Simulation in Engineering Design - Computer Aided Engineering and Simulation; Engineering Manufacturing and Materials; Sustainability and Design: Recyclability; Reliability and Lean Design Engineering; Interface with Industrial design; Economic considerations in design; Eco Design and Green Engineering Product Development

**UNIT – IV: FINANCIAL AND LEGAL ASPECTS OF BUSINESS:** Process for effective financial planning, types of budgets preparation, overview of specific ratios to measure financial performance, liquidity, asset management, profitability, leverage and comparative analysis, business laws enshrined in the Indian constitution, the policies of the state, Income tax structure, the labor laws.

**UNIT –V: MANAGEMENT OF GROWTH VENTURE:** Importance of Innovation as a differentiator in growth venture, Underlying opportunities, Strategic management for Launching process of growth ventures, understanding organizational & institutional aspects of growth ventures, Exit strategies of Growth ventures, Future prospects of venture financing of growth venture firms.

**TEXT BOOKS:**


1. Allen, K. R. (2018). Launching New Ventures: An Entrepreneurial Approach. United States: Cengage Learning.
2. Khanka, S. S. (2006). Entrepreneurial Development. India: S. Chand Limited.
3. Nelson, A. J., Byers, T. H., Dorf, R. C. (2018). Technology Ventures: From Idea to Enterprise. United Kingdom: McGraw-Hill Education.


**REFERENCES:**


1. Harrington, H. J. (2018). Creativity, Innovation, and Entrepreneurship: The Only Way to Renew Your Organization. United States: Taylor & Francis.
2. Smith, A., Pigneur, Y., Papadakos, T., Osterwalder, A., Bernarda, G. (2015). Value Proposition Design: How to Create Products and Services Customers Want. Germany: Wiley.
3. Allen, K. R. (2010). Entrepreneurship for Scientists and Engineers. United Kingdom: Pearson Prentice Hall.


| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 2 | 3 | - | 3 | - | 1 | - | - | - | 3 | - | | |
| **CO2** | - | 2 | 3 | - | 3 | - | - | - | - | - | 3 | - | | |
| **CO3** | - | - | - | - | - | - | - | - | - | - | 3 | - | | |
| **CO4** | - | 2 | 3 | - | - | - | - | - | - | - | - | - | | |
| **CO5** | 2 | - | 3 | - | - | - | - | - | 1 | - | 3 | - | | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

## (Autonomous)

**IV B.Tech I Semester**

| L | T | P | C |
|---|---|---|---|
| 3 | | | 3 |

**20AMB08 ESSENTIALS OF MANAGEMENT SCIENCE (Common to All Branches)**

**Course Outcomes**

After completion of the course student will be able to

CO1: Apply various areas of functional management for the prospects of business organization.

CO2: Apply management principles for decision making.

CO3: Apply various functions of Hr manager.

CO4: Use tools and techniques to become an effective manager.

CO5: Apply production tools and techniques in every area of business

**UNIT-I INTRODUCTION TO MANAGEMENT:** Nature, importance and Functions of Management, Approaches to Management - Taylor's Scientific Management - Henry Fayol's Principles of Management, Maslow's Theory of Human Needs, Douglas McGregor's Theory X and Theory Y, Leadership Styles .

**UNIT-II INTRODUCTION TO ORANISATION:** Types of Mechanistic and organic structures. Delegation, Decentralization - Formal and Informal Organization

**UNIT III OPERATIONS MANAGEMENT:** Principles and Types of Plant Layout - Methods of production (Job, batch and Mass Production), Work Study - Basic procedure involved in Method Study and Work Measurement

**UNIT IV MATERIALS MANAGEMENT:** Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records, Marketing: Functions of Marketing, Marketing Mix, Product Life Cycle and Channels of Distribution.

**UNIT V HUMAN RESOURCES MANAGEMENT (HRM):** Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Wage and Salary Administration, Job Evaluation and Merit Rating, Performance Appraisal

**Text Books:**


1. Aryasri, Management Science, TMH, 4 th Edition, 2009.
2. Stoner, Freeman, Gilbert, Management, Pearson Education, New Delhi, 6 th Edition, 2004.
3. PannerSelvem, Production and Operations Management, Prentice Hall of India, 3 rd Edition, 2012

**Reference Books:**


1. Kotler Philip & Keller Kevin Lane, Marketing Management, PHI, 12th Edition, 2005.
2. Koontz &Weihrich, Essentials of Management, TMH, 6 th Edition, 2005.
3. SubbaRao. P, Personnel and Human Resource Management, Himalaya Publishing House, 2000


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | - | - | - | - | 3 | - | 3 | - | | 1 |
| **CO2** | - | - | - | - | - | - | - | - | 3 | - | 3 | - | 1 | |
| **CO3** | - | - | - | - | - | - | - | - | 3 | - | - | - | | 1 |
| **CO4** | - | - | - | - | - | - | - | - | 3 | - | 3 | - | | |
| **CO5** | - | - | - | - | - | - | - | - | - | - | 3 | - | 1 | |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.TECH I SEMESTER (Common to CSE, DS, AI & ML)**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

### 20AIT20 SOFTWARE TESTING

**COURSEOUTCOMES**

After Completion of the course the student will be able to:

**CO1:** Design test cases suitable for a software development for different domains.
**CO2:** Identify suitable tests to be carried out.
**CO3:** Prepare test planning based on the document.
**CO4:** Document test plans and test cases designed.
**CO5:** Use automatic testing tools and develop and validate a test plan.

**UNIT-I INTRODUCTION**

Testing as an Engineering Activity – Testing as a Process – Testing Maturity Model- Testing axioms – Basic definitions – Software Testing Principles – The Tester‘s Role in a Software Development Organization – Origins of Defects – Cost of defects – Defect Classes – The Defect Repository and Test Design –Defect Examples- Developer/Tester Support of Developing a Defect Repository.

**UNIT - II TEST CASE DESIGN STRATEGIES**

Test case Design Strategies – Using Black Box Approach to Test Case Design – Boundary Value Analysis – Equivalence Class Partitioning – State based testing – Cause-effect graphing – Compatibility testing – user documentation testing – domain testing - Random Testing – Requirements based testing – Using White Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing – Coverage and Control Flow Graphs – Covering Code Logic – Paths – code complexity testing – Additional White box testing approaches- Evaluating Test Adequacy Criteria.

**UNIT - III LEVELS OF TESTING**

The need for Levels of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests – The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination System Testing – Acceptance testing – Performance testing – Regression Testing – Internationalization testing – Ad-hoc testing – Alpha, Beta Tests – Testing OO systems – Usability and Accessibility testing – Configuration testing –Compatibility testing – Testing the documentation – Website testing.

**UNIT - IV TEST MANAGEMENT**

People and organizational issues in testing – Organization structures for testing teams – testing services – Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items –

test management – test process – Reporting Test Results – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group- The Structure of Testing Group- .The Technical Training Program.

**UNIT - V TEST AUTOMATION**

Software test automation – skills needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation – Test metrics and measurements – project, progress and productivity metrics.

**TEXT BOOKS**

1. Srinivasan Desikan and Gopalaswamy Ramesh, ―Software Testing – Principles and Practices‖, Pearson Education, 2006.

2. Ron Patton, ―Software Testing‖, Second Edition, Sams Publishing, Pearson Education, 2007. AU Library.com

**REFERENCES**

1. Ilene Burnstein, ―Practical Software Testing‖, Springer International Edition, 2003.

2. Edward Kit,‖ Software Testing in the Real World – Improving the Process‖, Pearson Education, 1995.

3. Boris Beizer,‖ Software Testing Techniques‖ – 2nd Edition, Van Nostrand Reinhold, New York, 1990.

4. Aditya P. Mathur, ―Foundations of Software Testing _ Fundamental Algorithms and Techniques‖, Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008.

| PO / CO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | - | - | 3 | - | - | - | - | - | - | - | 1 | 2 |
| **CO2** | 2 | 3 | 3 | - | 2 | - | - | - | - | - | - | - | 2 | 1 |
| **CO3** | 2 | 3 | 3 | - | 3 | - | - | - | - | - | - | - | 3 | 2 |
| **CO4** | 2 | 3 | 3 | - | 2 | - | - | - | - | - | - | - | 2 | 1 |
| **CO5** | 3 | 3 | - | 2 | 3 | - | - | - | - | - | - | - | 1 | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Semester (Common to CSE, IT)**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

## 20ACS38 CRYPTO CURRENCIES AND BLOCK CHAIN TECHNOLOGIES

**Course Outcomes:**

After the completion of this course, student will be able to

CO1: Define the Fundamental concepts of Crypto currencies and Block chain Technologies
CO2: Demonstrate the application of hashing and public key cryptography in protecting the block chain.
CO3: Explain the elements of trust in block chain: Verification Validation and consensus.
CO4: Interpret crypto currency Regulation and for Block chain Applications

**UNIT- I**

**Introduction to Cryptography &Crypto currencies**: Cryptographic Hash Functions - Hash Pointers and Data Structures - Digital Signatures - Public Keys as Identities - A Simple Crypto currency - How Bitcoin Achieves Decentralization - Centralization vs. Decentralization - Distributed consensus - Consensus without identity using a block chain

**UNIT- II**

**Mechanics of Bitcoin:** Bitcoin transactions - Bitcoin Scripts - Applications of Bitcoin scripts - Bitcoin blocks - The Bitcoin network - Limitations and improvements
**How to Store and Use Bit coins -** Hot and Cold Storage - Splitting and Sharing Keys - Online Wallets and Exchanges - Payment Services - Transaction Fees - Currency Exchange Markets

**UNIT- III**

**Bitcoin Mining:** The task of Bitcoin miners - Mining Hardware- Energy consumption and ecology - Mining pools - Mining incentives and strategies
**Bitcoin and Anonymity:** Anonymity Basics - How to De-anonymize Bitcoin – Mixing - Decentralized Mixing - Zerocoin and Zerocash

**UNIT- IV**

**Community, Politics, and Regulation:** Consensus in Bitcoin - Bitcoin Core Software - Roots of Bitcoin - Governments Notice Bitcoin - Anti Money-Laundering - Regulation

**UNIT- V**

**Bitcoin as a Platform:** Bitcoin as an Append-Only Log - Bitcoins as "Smart Property" - Secure Multi-Party Lotteries in Bitcoin - Bitcoin as Public Randomness Source - Prediction Markets and Real World Data Feeds

**Altcoins and the crypto currency Ecosystem: Altcoins**: A Few Altcoins in Detail - Relationship Between Bitcoin and Altcoins - Merge Mining

**Text Book**


1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19, 2016).


**Reference Books**


1. Wattenhofer, The Science of the Blockchain
2. Antonopoulos, Mastering Bitcoin: Unlocking Digital Cryptocurrencies
3. Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System
4. DR. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger,"Yellow paper.2014.
5. Nicola Atzei, Massimo Bartoletti, and TizianaCimoli, A survey of attacks on Ethereum smart contracts


| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | 2 | 3 | - | - | - | - | - | - | - | - | 3 | 3 |
| CO2 | 2 | 3 | - | 2 | - | - | - | - | - | - | - | - | 3 | 2 |
| CO3 | 3 | 2 | 3 | 1 | - | - | - | - | - | - | 1 | - | 2 | 2 |
| CO4 | 3 | 2 | 2 | - | - | - | - | - | - | 1 | - | - | 2 | 3 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

## IV B.Tech I Semester (Common to CSE,IT)

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

**20ACS39 CLOUD COMPUTING**

**Course Outcomes:**

After Completion of the course the student will be able to:

CO1: Articulate the main concepts, key technologies, strengths and limitations of cloud Computing.
CO2: Learn the key and enabling technologies that help in the development of cloud.
CO3: Develop the ability to understand and use the architecture of compute and storage cloud,
CO4: Service and delivery models.
CO5: Analyze the core issues of cloud computing such as resource management and security.

**UNIT I - Introduction**

Introduction to Cloud Computing – Definition of Cloud – Cloud Characteristics - Evolution of Cloud Computing –Hardware Evolution – Internet Software Evolution – Server Virtualization.

**UNIT II - Cloud Enabled Technologies**

Service Oriented Architecture – REST and Systems of Systems – Message Oriented MiddlewareBasics of Virtualization –Implementation Levels of Virtualization – Virtualization Structures – Tools and Mechanisms – Virtualization of CPU –Memory – I/O Devices – Virtual Cluster and Resource Management – Virtualization for Data Center Automation.

**UNIT III –Cloud Architecture and Services**

Cloud Computing and Service Model – Data-Center Design and Interconnection Networks – Architecture Design of Compute and Storage Clouds – Public Cloud Platforms – Inter Cloud Resource Management – Cloud Security and Trust Management.

**UNIT IV – Security in Cloud and Common Standard in Cloud Computing**

Cloud Security Challenges – Software as a Service Security – The Open Cloud Consortium – Standard for Application Developers – Standard for Messaging – Standard for Security.

**UNIT V –Cloud Programming and Software Environments**

Feature of Cloud and Grid Platforms – Parallel and Distributed Programming Paradigm – Google App Engine – Amazon AWS and Microsoft Azure – Emerging Cloud Software Environment

**TEXT BOOKS:**

1. Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.
2. Rittinghouse, John W., and James F. Ransome, ―Cloud Computing: Implementation, Management and Security‖, CRC Press, 2017.

**REFERENCE BOOKS:**

1. RajkumarBuyya, Christian Vecchiola, S. ThamaraiSelvi, ―Mastering Cloud Computing‖, Tata McGraw Hill, 2013.
2. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing - A Practical Approach‖, Tata McGraw Hill, 2009.
3. George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud: Transactional Systems for EC2 and Beyond (Theory in Practice) ‖, O'Reilly, 2009.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | 1 | - | - | 2 | - | - | - | 1 | 1 | 1 |
| CO2 | 2 | - | - | - | 2 | - | - | 2 | - | - | - | 1 | 1 | 1 |
| CO3 | 2 | - | - | 1 | 2 | - | - | 2 | - | - | - | 1 | 1 | 1 |
| CO4 | 2 | - | - | 1 | 2 | - | - | 2 | - | - | - | 1 | 1 | 1 |
| CO5 | 2 | - | - | 1 | 2 | - | - | 2 | - | - | - | 1 | 1 | 1 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

| **IV B.TECH I SEMESTER** | **L** | **T** | **P** | **C** |
|---|---|---|---|---|
| | **3** | **0** | **0** | **3** |

### 20AIT21 MOBILE APPLICATION DEVELOPMENT

**Course Outcomes**

After Completion of the course the student will be able to:

CO1.Understand and debug Android application by setting up Android development environment

CO2.Implement adaptive, responsive user interfaces that work across a wide range of devices.

CO3.Applay long running tasks and background work in Android applications

CO4.Demonstrate methods in storing, sharing and retrieving data in Android applications

CO5.Analyze performance of android applications and understand the role of permissions and security

**UNIT I**

Get started; build your first app, Activities, Testing, debug and use support libraries.

**UNIT II**

User Interaction, Delightful user experience, testing your UI

.

**UNIT III**

Background Tasks, Triggering, scheduling and optimizing background tasks

**UNIT IV**

All about data, Preferences and Settings, Storing data using SQLite, Sharing data with content providers, loading data using Loaders.

**UNIT V**

Permissions, Performance and Security, Firebase and AdMob, Publish

**TEXTBOOKS**

1. Google Developer Training, "Android Developer Fundamentals Course – Concept Reference”, Google Developer Training Team, 2017. https://www.gitbook.com/book/google-developer-training/android-developer-
2. Mobile Applications Development – Dr. P. Rizwan Ahmed

**REFERENCES**

1.Erik Hellman, “Android Programming – Pushing the Limits”, $1^{st}$ Edition, Wiley India Pvt Ltd,2014.

2.Dawn Griffiths and David Griffiths, “Head First Android Development”, $1^{st}$ Edition, O’Reilly SPD Publishers,2015.

1. J F DiMarzio, “Beginning Android Programming with Android Studio”, $4^{th}$ Edition, Wiley India Pvt Ltd, 2016. ISBN-13:978-8126565580
2. Anubhav Pradhan, Anil V Deshpande, “ Composing Mobile Apps” using Android, Wiley 2014, ISBN:978-81-265-4660-2.

| **PO**<br>------------------<br>**CO** | **PO 1** | **PO 2** | **PO 3** | **PO 4** | **PO 5** | **PO 6** | **PO 7** | **PO 8** | **PO 9** | **PO 10** | **PO 11** | **PO 12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 2 | 2 | 3 | - | - | - | - | 3 | - | - | - | 1 | 2 |
| **CO2** | 2 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 3 |
| **CO3** | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 | 1 |
| **CO4** | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| **CO5** | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 1 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.TECH I SEMESTER**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

## 20AIT22 INFORMATION SECURITY

### COURSE OUTCOMES

After Completion of the course the student will be able to:

CO1: Discuss the basics of information security
CO2: Use the legal, ethical and professional issues in information security
CO3: Demonstrate the aspects of risk management.
CO4: Analysis of various standards in the Information Security System
CO5: Design and implementation of Security Techniques.

### UNIT I INTRODUCTION

History, what is Information Security, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

### UNIT II SECURITY INVESTIGATION

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues - An Overview of Computer Security - Access Control Matrix, Policy-Security policies, Confidentiality policies, Integrity policies and Hybrid policies

### UNIT III SECURITY ANALYSIS

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk - Systems: Access Control Mechanisms, Information Flow and Confinement Problem

### UNIT-IV LOGICAL DESIGN

Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

### UNIT V PHYSICAL DESIGN

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel

## TEXT BOOKS


1. Michael E Whitman and Herbert J Mattord, —Principles of Information Security‖, Vikas Publishing House, New Delhi, 2003
2. Computer and information security by.John R. Vacca


## REFERENCES


1. Micki Krause, Harold F. Tipton, — Handbook of Information Security Management‖, Vol 1-3 CRCPress LLC, 2004.

2. Stuart McClure, Joel Scrambray, George Kurtz, —Hacking Exposed‖, Tata McGraw- Hill, 2003

3. Matt Bishop, — Computer Security Art and Science‖, Pearson/PHI, 2002.


| PO<br>------------------<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 2 | 2 | 3 | - | - | - | - | 3 | - | - | - | 1 | 2 |
| **CO2** | 2 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 3 |
| **CO3** | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 | 1 |
| **CO4** | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| **CO5** | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 1 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Semester IT** **L T P C**

**3 0 0 3**

## 20AIT23 - SEARCH ENGINE OPTIMIZATION

**COUURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1: Describe the main search engine optimisation techniques for business websites

CO2: Discuss the process of effective SEO, including keyword research, writing optimized content, getting web pages indexed by search engines and tracking the outcomes

CO3: Gain access to new online tools and resources to help implement successful SEO campaigns

CO4: Discuss 'link popularity' and why it is an important part of the optimisation process

CO5: Identify ways Google Ads and Google Analytics can be used as part of a search marketing strategy.

**UNIT I**

**Introduction to The Search Engines**: The Mission of Search Engines, The Market Share of Search Engines, The Human Goals of Searching, Determining Searcher Intent: A Challenge for Both Marketers and Search Engines How People Search, How Search Engines Drive Commerce on the Web, Eye Tracking: How Users Scan Results Pages, Click Tracking: How Users Click on Results, Natural Versus Paid.

**UNIT II**

**Search Engine Basics:** Understanding Search Engine Results, Algorithm-Based Ranking Systems: Crawling, Indexing, and Ranking, Determining Searcher Intent and Delivering Relevant, Fresh Content, Analyzing Ranking Factors, Using Advanced Search Techniques, Vertical Search Engines, Country -Specific Search Engines.

**UNIT III**

**Determining SEO Objectives and Defining Site's Audience:** Setting SEO Goals and Objectives, Developing an SEO Plan Prior to Site Development, Understanding Audience and Finding Niche, SEO for Raw Traffic, SEO for E-Commerce Sales, SEO for Mindshare/Branding, SEO for Lead Generation and Direct Marketing, SEO for Reputation Management, SEO for Ideological Influence.

**UNIT IV**

**First Stages of SEO:** The Major Elements of Planning, Identifying the Site Development Process and Players, Defining Site's Information Architecture, Auditing an Existing Site to Identify SEO Problems, Identifying Current Server Statistics Software and Gaining Access, Determining Top Competitors, Assessing Historical Progress, Benchmarking Current Indexing Status Benchmarking Current Rankings, Benchmarking Current Traffic Sources and Volume, Leveraging Business Assets for SEO, Combining Business Assets and Historical Data to Conduct SEO/Website SWOT Analysis.

**UNIT V**

**Developing an SEO-Friendly Website:** Making Site Accessible to Search Engines, Creating an Optimal Information Architecture, Root Domains, Subdomains, and Microsites, Optimization of Domain Names/URLs, Keyword Targeting, Content Optimization, Duplicate Content Issues Controlling Content with Cookies and Session IDs, Content Delivery and Search Spider Control, Redirects, Content Management System (CMS) Issues, Optimizing Flash, Best Practices for Multilanguage/Country Targeting.

**TEXT BOOKS:**


1. Eric Enge, Stephan Spencer, Rand Fishkin, Jessie C Stricchiola, “The Art of SEO : Mastering Search Engine Optimization”, O'Reilly Media, October, 2009.


**REFERENCES:**


1. David Amerland, Google Semantic Search, Pearson
2. Jerri L. Ledford, “SEO: Search Engine Optimization Bible”, 2nd Edition, Wiley India, April, 2009
3. John I Jerkovic, “SEO Warrior: Essential Techniques for Increasing Web Visibility”, O'Reilly


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 1 | 2 | | | | | | | | | | 1 | |
| CO2 | | | | | 3 | | | | 2 | | 1 | | | |
| CO3 | | 2 | | 2 | | 3 | | | | | | | | 2 |
| CO4 | | | | | 2 | 3 | 2 | | 2 | | | | | |
| C05 | | | | 2 | | | | | | | | | 1 | |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV Year I Sem (Common to IT, CSE, DS, AI & ML)** **L T P C**
**3 0 0 3**

### 20AIT24 SOFTWARE QUALITY ASSURANCE AND TESTING

**COURSEOUTCOMES:**
After Completion of the course the student will be able to:

CO1: Perform functional and nonfunctional tests in the life cycle of the software product.
CO2: Understand system testing and test execution process.
CO3: Identify defect prevention techniques and software quality assurance metrics.
CO4: Apply techniques of quality assurance for typical applications.

**UNIT I SOFTWARE TESTING - CONCEPTS, ISSUES, AND TECHNIQUES**
Quality Revolution, Verification and Validation, Failure, Error, Fault, and Defect, Objectives of Testing, Testing Activities, Test Case Selection White-Box and Black ,test Planning and design, Test Tools and Automation, . Power of Test. Test Team Organization and management-Test Groups, Software Quality Assurance Group, System Test Team Hierarchy, and Team Building.

**UNIT II SYSTEM TESTING**
System Testing - System Integration Techniques-Incremental, Top Down Bottom Up Sandwich and Big Bang, Software and Hardware Integration, Hardware Design Verification Tests, Hardware and Software Compatibility Matrix Test Plan for System Integration. Built- in Testing. functional testing - Testing a Function in Context. Boundary Value Analysis, Decision Tables. acceptance testing - Selection of Acceptance Criteria, Acceptance Test Plan, Test Execution Test. software reliability - Fault and Failure, Factors Influencing Software, Reliability Models

**UNIT III SYSTEM TEST CATEGORIES**
System test categories Taxonomy of System Tests, Interface Tests Functionality Tests. GUI Tests, Security Tests Feature Tests, Robustness Tests, Boundary Value Tests Power Cycling Tests Interoperability Tests, Scalability Tests, Stress Tests, Load and Stability Tests, Reliability Tests, Regression Tests, Regulatory Tests.

Test Generation from FSM models- State-Oriented Model. Finite-State Machine Transition Tour Method, Testing with State Verification. Test Architectures-Local, distributed, Coordinated, Remote. system test design- Test Design Factors Requirement Identification, modeling a Test Design Process Test Design Preparedness, Metrics, Test Case Design Effectiveness. system test execution- Modeling Defects, Metrics for Monitoring Test Execution .Defect Reports, Defect Causal Analysis, Beta testing, measuring Test Effectiveness.

**UNIT IV SOFTWARE QUALITY**
Software quality - People‘s Quality Expectations, Frameworks and ISO-9126, McCall‘s Quality Factors and Criteria – Relationship. Quality Metrics.Quality Characteristics ISO 9000:2000 Software

Quality Standard. Maturity models- Test Process Improvement ,Testing Maturity Model.

**UNIT V SOFTWARE QUALITY ASSURANCE**

Quality Assurance - Root Cause Analysis, modeling, technologies, standards and methodologies for defect prevention. Fault Tolerance and Failure Containment - Safety Assurance and Damage Control, Hazard analysis using fault-trees and event-trees. Comparing Quality Assurance Techniques and Activities.QA Monitoring and Measurement, Risk Identification for Quantifiable Quality Improvement. Case Study: FSM-Based Testing of Web-Based Applications.

**TEXT BOOKS**

1. Software Testing And Quality Assurance-Theory and Practice, KshirasagarNakPriyadarshiTripathy, John Wiley & Sons Inc,2008

**REFERENCES:**


1. Software Quality Engineering: Testing, Quality Assurance, and Quantifiable Improvement, Jeff Tian, John Wiley & Sons, Inc., Hoboken, New Jersey. 2005.
2. Software Quality Assurance - From Theory to Implementation, Daniel Galin, Pearson Education Ltd UK, 2004
3. Software Quality Assurance, MilindLimaye, TMH ,New Delhi, 2011


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C02 | 3 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| C03 | 2 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | 2 | 1 |
| C04 | 2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 1 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV BTECH I SEM** **L T P C**
**3 0 0 3**

### 20AIT25 PARALLEL AND DISTRIBUTED SYSTEMS

**COURSE OUTCOMES**

After Completion of the course the student will be able to:

CO1: Apply parallel and distributed computing architectures for any given problem

CO2: Apply problem solving (analysis, design, and development) skills to distributed Applications

CO3: Develop applications by incorporating parallel and distributed computing architectures

CO4: Develop applications by incorporating fault tolerance

CO5: Convert a sequential algorithm to a parallel one

**UNIT II NTRODUCTION TO PARALLEL COMPUTING**

Scope of Parallel Computing – Parallel Programming Platforms – Implicit Parallelism – Limitations of Memory System Performance – Control Structure of Parallel Platforms – Communication Model of Parallel Platforms – Physical Organization of Parallel Platforms – Communication Costs in Parallel Machines – Impact of Process - Processor Mapping and Mapping Techniques.

**UNIT II PARALLEL ALGORITHM DESIGN**

Preliminaries – Decomposition Techniques – Characteristics of Tasks and Interactions – Mapping Techniques for Load Balancing – Methods for Containing Interaction Overheads – Parallel Algorithm Models – Basic Communication Operations – One-to-All Broadcast and All-to-One Reduction – All-to-All Broadcast and Reduction – All-Reduce and Prefix Sum Operations –Scatter and Gather – All-to-All Personalized Communication- Circular Shift – Improving the Speed of some Communication Operations

**UNIT III PROGRAMMING USING MESSAGE PASSING AND SHARED ADDRESS SPACE**

Principles of Message Passing Programming – Building Blocks – Send and Receive Operations – MPI – Message Passing Interface – Topologies and Embedding – Overlapping Communication with Computation – Collective Communication and Computation Operations – Groups and SCommunicators – POSIX thread API – OpenMP: a Standard for Directive based Parallel Programming – Applications of Parallel Programming - Matrix-Matrix Multiplication – Solving Systems of Equations – Sorting Networks - Bubble Sort Variations – Parallel Depth First Search

**UNIT IV DISTRIBUTED COMPUTING PARADIGM**

Paradigms for Distributed applications – Basic algorithms in Message passing Systems – Leader Election in Rings – Mutual Exclusion in Shared Memory

**UNIT V FAULT TOLERANT DESIGN**

Synchronous Systems with Crash Failures – Byzantine Failures – Impossibility in Asynchronous Systems - Formal Model for Simulation – Broadcast and Multicast – Specification of a Broadcast Service – Implementing a Broadcast Service – Multicast in Groups – Distributed Shared Memory – Linearizable – Sequentially Consistent Shared Memory – Algorithms

**TEXT BOOKS:**


1. Ananth Grama, Anshul Gupta, George Karypis and Vipin Kumar, ―Introduction to Parallel Computing‖, Second Edition, Pearson Education, 2009.
2. Haggit Attiya and Jennifer Welch, ―Distributed Computing – Fundamentals, Simulations and Advanced Topics‖, Second Edition, Wiley, 2012.


**REFERENCES:**


1. Michael Quinn, ―Parallel Computing - Theory and Practice‖, Second Edition, Tata McGraw Hill, 2002.
2. Norman Matloff, ―Parallel Computing for Data Science – With Examples in R, C++ and CUDA‖, Chapman and Hall/CRC, 2015.
3. Wan Fokkink, ―Distributed Algorithms: An Intuitive Approach‖, MIT Press, 2013.
4. M.L. Liu, ―Distributed Computing – Principles and Applications‖, First Edition, Pearson Education, 2011.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 1 | 1 | 2 | 3 | 2 | - | - | - | - | - | - | - | 1 | 2 |
| C02 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 2 | 3 |
| C03 | 2 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | 3 | 1 |
| C04 | 2 | 3 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 2 |
| C05 | 3 | 2 | 1 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.TECH I SEMESTER (Common to IT, AI & ML)**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

## 20ACM08 DEEP LEARNING

**COURSEOUTCOMES:**

After Completion of the course the student will be able to:

CO1: Explain the basics of deep neural networks.
CO2: Use Convolution Neural Network for image processing.
CO3: Apply deep learning algorithms for data science
CO4: Apply deep learning algorithms for variety applications

**UNIT I DEEPNETWORKSBASICS**

Linear Algebra: Scalars-Vectors-Matrices and tensors; Probability Distributions—Gradient based Optimization–Machine Learning Basics: Capacity—Over fitting and under fitting-Hyper parameters and validation sets--Estimators—Bias and variance--Stochastic gradient descent -Challenges -motivating deep learning; Deep Networks: Deep feed forward networks; Regularization--Optimization.

**UNITII CONVOLUTIONAL NEURAL NETWORKS**

Convolution Operation -- Sparse Interactions -- Parameter Sharing -- Equivariance -- Pooling--Convolution Variants: Strided -- Tiled -- Transposed and dilated convolutions; CNN Learning: Nonlinearity Functions -- Loss Functions -- Regularization -- Optimizers -- Gradient Computation.

**UNIT III DEEP LEARNING ALGORITHMS FOR AI**

Artificial Neural Networks – Linear Associative Networks – Perceptron's -The Backpropagation Algorithm - Hopfield Nets - Boltzmann Machines - Deep RBMs - Variational Autoencoders - Deep Backprop Networks- Autoencoders

**UNIT IV DATA SCIENCE AND DEEP LEARNING**

Data science fundamentals and responsibilities of a data scientist - life cycle of data science – Data science tools - Data modeling, and featurization - How to work with data variables and data science tools - How to visualize the data - How to work with machine learning algorithms and Artificial Neural Networks

**UNIT V APPLICATIONS OF DEEP LEARNING**

Detection in chest X-ray images -object detection and classification -RGB and depth image fusion -NLP tasks - dimensionality estimation - time series forecasting -building electric power grid for controllable energy resources - guiding charities in maximizing donations and robotic control in industrial environments.

**TEXTBOOK.S:**

- IanGoodfellow,YoshuaBengio,AaronCourville,``DeepLearning",MITPress,2016
- Stone,James.(2019).ArtificialIntelligenceEngines:ATutorialIntroductiontothe
- MathematicsofDeepLearning,SebtelPress,UnitedStates,2019
- Vance, William, Data Science:A Comprehensive Beginners Guide to Learn the Real ms of Data Science (Hardcover-2020),Joining the dots tv Limited
- Wani,M.A.,Raj,B.,Luo,F.,Dou,D.(Eds.),Deep Learning Applications, Volume 3,Springer Publications 2022
- CharuC.Aggarwal,``NeuralNetworksandDeepLearning:ATextbook",SpringerInternational Punlishing,2018.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 2 | | | | | | | | | 2 | 2 |
| CO2 | 3 | 2 | 1 | 2 | | | | | | | | 2 | 2 |
| CO3 | 3 | 3 | 2 | 1 | | | | | | | | 2 | 3 |
| CO4 | 3 | 1 | 1 | | | | | | | | | 3 | 2 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY, (AUTONOMOUS)**

**L T P C**

**3 0 0 3**

**IV B. TECH- I SEMESTER (Common to IT, CSE)**

**20ACS43 BIG DATA ANALYTICS**

**Course Outcomes:**

After Completion of the course the student will be able to:

1. Understand and Illustrate characteristics of big data and big data challenges in different domains including social media, transportation, finance and medicine.
2. Apply Hadoop framework to solve big data problem
3. Apply MapReduce, PIG scripts, Hive SQL queries and HBase concepts to handle big data problems
4. Understand stream processing into real time big data applications

**UNIT-I: Introduction to Big Data:**

Introduction to Big Data, Definition of analytics, Characteristics of Big Data –Analytics flow for big data – Big data stack, Architectural components and design styles, Load levelling with queues, Load balancing with multiple consumers, CAP, Bloom Filter, Lambda Architecture, Scheduler, Pipes & Filters.

**Unit II: Hadoop Framework:**

Hadoop distributed File system: The design of HDFS, HDFS concepts, The Command Line Interface, Hadoop File systems, The Java Interface, Data flow, parallel copying with distcp, Hadoop archives.

**Unit III Frameworks and Applications:**

Introduction to MapReduce Framework, Anatomy of a MapReduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution. MapReduce Types and Formats: MapReduce Types, Input Formats, Output Formats. MapReduce Features: Counters, Sorting, Joins. Case study on WordCount program, Matrix Multiplication with MapReduce

**Unit IV: Data Analytic Tools:**

Pig: Introduction to Pig, Pig Latin, Data processing operators. Hive: Hive installation, Running hive, Compare hive with traditional databases, HiveQL, Querying Data. HBase: Clients, Praxis. Zookeeper: The Zookeeper service, Sqoop: Introduction to Sqoop, Database Imports: A deeper look, Working with imported data.

**UNIT V: Stream Processing:**

Mining data streams: Introduction to Streams Concepts, Stream Data Model, Sampling Data in a Stream, Filtering Streams, Counting Distinct Elements in a Stream, Estimating Moments, Counting Oneness in a Window, Decaying Window. Case Studies –Recommendation Systems - Stock Market Predictions.

**Text Books:**

1. Bart Baesens, “Analytics in a Big Data World: The Essential Guide to Data Science and its Applications (WILEY Big Data Series)”, John Wiley & Sons,2014.
2. Tom White, “Hadoop: The Definitive Guide”, Third Edition, O’reilly Media, Fourth Edition,2015.
3. Anand Rajaraman and Jeffrey David Ullman, “Mining of Massive Datasets”, CUP, 2012.

**References:**

1. Bill Franks, “Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics”, John Wiley& sons,2012.
2. Paul Zikopoulos, DirkdeRoos, Krishnan Parasuraman, Thomas Deutsch, JamesGiles, David Corrigan, “Harness the Power of Big Data:The IBM Big Data Platform”, Tata McGraw Hill Publications,2012.
3. ArshdeepBahga and Vijay Madisetti, “Big Data Science & Analytics: A Hands On Approach “, VPT,2016.
4. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, “Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data”, McGrawHill Publishing,2012.
5. https://file.techscience.com/uploads/attached/file/20210209/20210209005411_48715.pdf (Case study Reference)
6. https://lendap.wordpress.com/2015/02/16/matrix-multiplication-with-mapreduce/ (Case Study Reference)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 3 |
| CO2 | 2 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 |
| CO3 | 3 | 2 | 3 | 1 | 3 | - | - | - | - | - | - | - | 3 | 3 |
| CO4 | 2 | 2 | 3 | 1 | 1 | | | | | | | | 3 | 3 |

## (AUTONOMOUS)

**IV BTECH, I SEM (Common to IT, CSE)** **L T P C**
**3 0 0 3**

### 20AIT26 SOFTWARE ARCHITECTURE

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1: Explain influence of software architecture on business and technical activities
CO2: Identify key architectural structures
CO3: Use styles and views to specify architecture
CO4: Design document for a given architecture

**UNIT I INTRODUCTION AND ARCHITECTURAL DRIVERS**

Introduction – What is software architecture? – Standard Definitions – Architectural structures – Influence of software architecture on organization-both business and technical – Architecture Business Cycle- Introduction – Functional requirements – Technical constraints – Quality Attributes**.**

**UNIT II QUALITY ATTRIBUTE WORKSHOP**

Quality Attribute Workshop – Documenting Quality Attributes – Six part scenarios – Case studies.

**UNIT IIIARCHITECTURAL VIEW**

Introduction – Standard Definitions for views – Structures and views – Representing views-available notations – Standard views – 4+1 view of RUP, Siemens 4 views, SEI's perspectives and views – Case studies

**UNIT IVARCHITECTURAL STYLES**

Introduction – Data flow styles – Call-return styles – Shared Information styles – Event styles – Case studies for each style.

**UNIT VDOCUMENTING THE ARCHITECTURE**

Good practices – Documenting the Views using UML – Merits and Demerits of using visual languages – Need for formal languages – Architectural Description Languages – ACME – Case studies. Special topics: SOA and Web services – Cloud Computing – Adaptive structures

**TEXT BOOKS**

1. Len Bass, Paul Clements, and Rick Kazman, "Software Architectures Principles and Practices", 2nd Edition, Addison-Wesley, 2003.

2. Anthony J Lattanze, “Architecting Software Intensive System. A Practitioner’s Guide”, Auerbach Publications, 2010.

**REFERENCES BOOKS:**


1. Paul Clements, Felix Bachmann, Len Bass, David Garlan, James Ivers, Reed Little, Paulo Merson, Robert Nord, and Judith Stafford, “Documenting Software Architectures. Views and Beyond”, 2nd Edition, Addison-Wesley, 2010.
2. Paul Clements, Rick Kazman, and Mark Klein, “Evaluating software architectures: Methods and case studies. Addison-Wesley, 2001.
3. Rajkumar Buyya, James Broberg, and Andrzej Goscinski, “Cloud Computing. Principles and Paradigms”, John Wiley & Sons, 2011
4. Mark Hansen, “SOA Using Java Web Services”, Prentice Hall, 2007


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 1 | 1 | 2 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 |
| C02 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 3 |
| C03 | 2 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | 3 | 1 |
| C04 | 1 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**L T P C**

**3 0 0 3**

**IV YEAR B.TECH I SEMESTER (Common to DS)**

## 20AIT27 AGILE SOFTWARE DEVELOPMENT

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1 Realize the importance of interacting with business stakeholders in determining the requirements for a software system

CO2 Understand iterative software development processes: how to plan them, how to execute them.

CO3 Understand the impact of social aspects on software development success.

CO4 Develop techniques and tools for improving team collaboration and software quality.

CO5 Build Software process improvement as an ongoing task for development teams and Show how agile approaches can be scaled up to the enterprise level.

### UNIT I AGILE METHODOLOGY

Theories for Agile Management – Agile Software Development – Traditional Model vs. Agile Model - Classification of Agile Methods – Agile Manifesto and Principles – Agile Project Management – Agile Team Interactions – Ethics in Agile Teams - Agility in Design, Testing – Agile Documentations – Agile Drivers, Capabilities and Values

### UNIT II AGILE PROCESS

Lean Production - SCRUM, Crystal, Feature Driven Development- Adaptive Software Development - Extreme Programming: Method Overview – Lifecycle – Work Products, Roles and Practices.

### UNIT III AGILITY AND KNOWLEDGE MANAGEMENT

Agile Information Systems – Agile Decision Making - Earl_S Schools of KM – Institutional Knowledge Evolution Cycle – Development, Acquisition, Refinement, Distribution, Deployment , Leveraging – KM in Software Engineering – Managing Software Knowledge – Challenges of Migrating to Agile Methodologies – Agile Knowledge Sharing – Role of Story-Cards – Story-Card Maturity Model (SMM).

### UNIT IV AGILITY AND REQUIREMENTS ENGINEERING

Impact of Agile Processes in RE–Current Agile Practices – Variance – Overview of RE Using Agile – Managing

Unstable Requirements – Requirements Elicitation – Agile Requirements Abstraction Model – Requirements Management in Agile Environment, Agile Requirements Prioritization – Agile Requirements Modeling and Generation – Concurrency in Agile Requirements Generation.

**UNIT V AGILITY AND QUALITY ASSURANCE** 9

Agile Product Development – Agile Metrics – Feature Driven Development (FDD) – Financial and Production Metrics in FDD – Agile Approach to Quality Assurance - Test Driven Development – Agile Approach in Global Software Development.

**TEXT BOOKS:**

1. David J. Anderson and Eli Schragenheim, ―Agile Management for Software Engineering: Applying the Theory of Constraints for Business Results‖, Prentice Hall, 2003.
2. Hazza and Dubinsky, ―Agile Software Engineering, Series: Undergraduate Topics in Computer Science‖, Springer, 2009.

**REFERENCES:**

1. Craig Larman, ―Agile and Iterative Development: A Manager_s Guide‖, Addison-Wesley, 2004.
2. Kevin C. Desouza, ―Agile Information Systems: Conceptualization, Construction, and Management‖, Butterworth-Heinemann, 2007.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | | | | | | | | | | | | | |
| CO2 | | | 2 | | | 3 | | 1 | | 1 | 1 | | 1 | |
| CO3 | | | | | 2 | | 2 | | | | | | | |
| CO4 | 2 | | 1 | | | | | | 2 | | | 1 | | 2 |
| C05 | | | | | | 2 | | | | | 2 | | 2 | |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Semester (Common to IT,CSE( DS))**

**L T P C**

**3 0 0 3**

# 20ACD07 DATA MODELLING TECHNIQUES

**COURSE OUTCOME:**

After Completion of the course the student will be able to:

CO1: Recognize the process of formulating business objectives, data processing for predictive models.

CO2: Compare and contrast the underlying predictive modeling techniques.

CO3: Relate appropriate predictive modeling approaches to identify particular cases Analyze

CO4: In for the uses of Support Vector Machines and clustering techniques.

CO5: Applypredictivemodellingapproachesusingasuitablepackageusingrapidminertool.

**UNIT-I DATA UNDERSTANDING&PREPARATION**

Identifying business objectives, translating business objectives to data mining goals, reading data from various sources – Database/ Excel/ Text/others, data visualization – tabular & graphic, distributions and summary statistics, field reordering, Reclassify data.

**UNIT-II DATA TRANSFORMATIONS**

Data quality issues, Data Audit, anomalies, relationships among variables, Extent of Missing Data, Segmentation, Outlier detection, Variable transformations, Variable derivation, Variable selection, Automated Data Preparation, combining data files, data restructuring, Aggregation, Duplicates removal, Sampling cases, Data Caching, Partitioning data, Missing Value replacement.

**UNIT-III MODELING TECHNIQUES – I**

Partitioning The Data - Training, Validation & Testing, Model selection, Model development techniques - Linear regression, Logistic regression, Discriminant analysis, Bayesian networks, Neural networks, Rule Induction.

**UNIT-IV MODELING TECHNIQUES – II**

Support vector machines, Cox regression, Time series analysis, Decision trees, Clustering, Association Rules, Sequence Detection, Which Technique to use when.

**UNIT-V MODEL EVALUATION & DEPLOYMENT**

Model Validation, Determining Model Accuracy, Rule Induction Using CHAID, Automating Models for Categorical Targets, Automating Models for Continuous Targets, Comparing and Combining Models, Evaluation Charts for Model Comparison, Using Propensity Scores, Meta- Level Modelling, Error Modeling, Deploying Model, Exporting Model Results, Assessing Model Performance, Updating A Model.

**TEXTBOOKS / REFERENCES**


1. Jose, Jeeva. Introduction to Machine Learning. Khanna Book Publishing Co., 2020.
2. Data Mining & Predictive Modeling, IBM, ICE Publications.
3. MonteF.Hancock,Jr .Practical Data Mining.1stedition. Auerbach Publications, 2011.
4. Jain,V.K. Machine Learning. First edition. Khanna Book Publishing Company, 2019.


| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 3 |
| **CO2** | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| **CO3** | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 | 2 |
| **CO4** | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 | 2 |
| **CO5** | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV BTECH I SEM** **L T P C**

**3 0 0 3**

# 20AIT28 SOFTWARE CONFIGURATION MANAGEMENT

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1: Identify the need for engineering approach to software development and various processes of requirements analysis for software

CO2: Analyze various software engineering models and apply methods for design and development of software projects

CO3: Work with various techniques, metrics and strategies for Testing software projects

CO4: Understand the SCM standards and controls.

CO5: Apply the SCM tools and implementation.

## UNIT I

Overview of software configuration management - SCM: Concepts and definitions - SDLC phases - Pitfalls in the software development process - Need and importance of SCM - Benefits of SCM

## UNIT II

Overview of SCM - Phases of SCM implementation - Objectives of SCM implementation - SCM system design – plan preparation - team organization - infrastructure setup - team training - system implementation - system operation and maintenance - system retirement - SCM tool retirement

## UNIT III

Impact of configuration item selection - item description - Configuration control - Change initiation – classification - Evaluation/analysis – disposition - implementation - verification - change control – Problem reporting and tracking. Defect classification - severity – prevention. Status accounting – information gathering – database – reports. Configuration verification and audits

## UNIT IV

Version control - System building - Release management - Interface control - Software library. SCM standards – Military standards - International/commercial standards

## UNIT V

Capability Maturity Model - Maturity Model Integration - SCM plan and the incremental approach - SCM tools – standards – Audit. SCM organization - SCM tools. Documentation management and control and product data management - SCM implementation - SCM operation and maintenance - SCM in special circumstances

## TEXT BOOKS

1. Alexis Leon, “Software Configuration Management Handbook”, Artech House Publishers, 2004

2. Sean Kenefick, “Real World Software Configuration Management”, Apress, 2008

**REFERENCE BOOKS**

1. Brad Appleton, Kyle Brown, Stephen P. Berczuk, “Software Configuration Management Patterns : Effective Teamwork, Practical Integration”, Addison-Wesley, 2002
2. Stephen P. Berczuk “Software Configuration Management Patterns: Effective Teamwork”, Practical Integration. Addison-Wesley, 2003.
3. Alexis Leon. Software Configuration Management Handbook (2nd Ed.). Artech House, 2005.
4. Jalote, Pankaj, An integrated Approach to Software Engineering, Narosa (2005)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C02 | 3 | 3 | 2 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| C03 | 2 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 2 | 3 |
| C04 | 2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 2 |
| CO5 | 2 | 3 | 2 | 1 | 1 | 1 | - | - | - | - | - | - | 1 | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Semester(Common to IT,CSE, CSE(DS), CSE (AI &ML))**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

## 20ACS46 COMPUTER VISION

**Course Outcomes:**

After Completion of the course the student will be able to:

1. Review image processing techniques for computer vision.
2. Understand shape and region analysis.
3. Understand Hough Transform and its applications to detect lines, circles, ellipses.
4. Implement three-dimensional image analysis techniques.
5. Design some applications using computer vision algorithms.

### UNIT I IMAGE PROCESSING FOUNDATIONS

Introduction – The Nature of vision - From Automated Visual Inspection to Surveillance – Images and Imaging Operations– Image Processing Operation – Basic image filtering operations–Thresholding techniques.

### UNIT II SHAPES AND REGIONS

Edge detection techniques – Corner and interest point detection – Mathematical morphology -Texture - Binary shape analysis – connectedness in Binary Images – Object labeling and counting – Size filtering –Distance functions and their uses–skeletons and thinning–Other Measure for Shape recognition – boundary tracking procedures– Boundary Pattern Analysis – Centroidal profiles – Problems With The Centroidal Profile Approach –Accuracy of Boundary Length Measures.

### UNITIIIHOUGHTRANSFORM

Line detection – Application of Hough Transform (HT) for line detection – The foot-of-normal method – Longitudinal Line Localization - Final Line Fitting – Using RANSAC For Straight Line Detection– Ht based circular object detection–Location Of Laparoscopic Tools –Circle and Ellipse Detection – Hough-Based Schemes For Circular Object Detection - The Problem Of Accurate Center Location - Overcoming The Speed Problem – Ellipse Detection – Casestudy : Human iris Location –holed etection

### UNIT IV 3D VISION AND MOTION

3-D Vision— The Variety Of Methods – Projection Schemes For Three-Dimensional Vision – Shape from Shading – photometric stereo – The Assumption Of Surface Smoothness - shape from texture – Use Of Structured Lighting - Three-Dimensional Object Recognition

Schemes - Horaud’s Junction Orientation Technique - An Important Paradigm—Location Of

Industrial Parts

**UNIT VAPPLICATIONS**

Application: Automated Visual Inspection –The Process of Inspection –The Types Of Object to Be Inspected –X-Ray Inspection – Surveillance–foreground and background separation–particleilters–Use of Color Histogram for Tracking–Implementation of Particle Filters – Chamfer Matching, Tracking, And Occlusion - Combining Views From Multiple Cameras - Applications To The Monitoring Of Traffic Flow - License Plate Location – Occlusion Classification For Tracking –Distinguishing Pedestrians By Their Gait –Human Gait Analysis - Model-Based Tracking Of Animals.

**TEXT BOOK**


1. E.R.Davies,―Computer&MachineVision‖,FourthEdition,AcademicPress,2012.


**REFERENCES**


1. D.L.Baggio etal.,―Mastering Open CV with Practical Computer Vision Projects, Packt Publishing,2012.
2. JanErik Solem,―Programming Computer Vision with Python: Tools and algorithms for analyzing images, O'ReillyMedia,2012.
3. MarkNixon and Alberto S. Aquado, ―Feature Extraction & Image Processing for Computer Vision, Third Edition, AcademicPress,2012.
4. R. Szeliski ― Computer Vision: Algorithms and Applications, Springer 2 011.
5. J.D. Prince ― Computer Vision: Models, Learning and Inference ‖, Cambridge University Press 2012.


| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | **3** | | | | | | | **1** | | | | | **3** | |
| **CO2** | **2** | **2** | **3** | **2** | | | | **2** | | | | | **2** | **1** |
| **CO3** | **2** | **2** | **2** | **3** | | **2** | **3** | **1** | | **2** | | | **1** | **2** |
| **CO4** | **2** | **1** | **3** | **3** | | **3** | **2** | | | **3** | | | | **3** |
| **C05** | **1** | | | **2** | | **3** | **3** | | | **3** | | | | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Semester**

## 20AEC56 EMBEDDED SYSTEMS

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

**Course Outcomes:**

After Completion of the course the student will be able to:

**CO1:** Explain concept of embedded systems and its applications

**CO2**: Define various processors and explain their architecture

**CO3:** Design State machine and Concurrent Process Models

**CO4:** Identify embedded components, peripheral devices and apply various processor scheduling algorithms.

**UNIT I INTRODUCTION TO EMBEDDED SYSTEMS**

Introduction to Embedded Systems: Definition of embedded system, history of embedded systems, classification of embedded systems, characteristics of embedded systems, major application areas of embedded systems, purpose of embedded systems , Embedded hardware units and devices in a system, Processor and OS trends in embedded systems, Core of the embedded system, memory, sensors and actuators, embedded software in a system and an overview of programming languages, examples of the embedded systems,

**UNIT II INTRODUCTION TO ASIP &DSP PROCESSORS:**

Design challenge, processor technology, IC technology, Design Technology, Trade-offs. Custom Single purpose processors- RT-level combinational logic, sequential logic (RT-level), custom single purpose processor design (RT-level), optimizing custom single purpose processors. General Purpose Processors-

Basic architecture, operation- Pipelining, Programmer's view, development environment, Application Specific Instruction-Set Processors (ASIPs)–Micro Controllers and Digital Signal Processors.

**UNIT III STATE MACHINE AND CONCURRENT PROCESS MODELS:**

Introduction, models Vs. languages, finite state machines with data path model (FSMD), using statemachines,programstatemachinemodel(PSM),concurrentprocessmodel,concurrentprocesses,com munication among processes, synchronization among processes, implementation, data flow model, real-time systems.

**UNIT IV STANDARD SINGLE PURPOSE PROCESSORS: PERIPHERALS:**

Timers, counters and watch dog timers, real time clock. Communication Interface-Need for communication interfaces, RS232/UART, RS422/RS485, USB, Infrared, IEEE1394Firewire, Ethernet, IEEE802.11, Blue tooth.

**UNITV EMBEDDED / RTOSCONCEPTS:**

REAL-TIMEOPERATING SYSTEMS – Operating System Overview, Operating System - Functions, Types and Services of Operating System, Architecture of the Kernel, Tasks and Task scheduler,
Interruptserviceroutines,Semaphores,Mutex.Mailboxes,MessageQueues,EventRegisters,Pipes,Signal s,Timers,Memory Management, Priority inversion problem.

**TEXTBOOKS:**


1. Frank Vahid, Tony D.Givargis,“ Embedded System Design–A Unified Hardware / Software Introduction”, JohnWiley,2002.
2. KVKK Prasad,“ Embedded /RealTimeSystems”,DreamtechPress,2005.

**REFERENCEBOOKS:**


1. David E. Simon, " An Embedded Software Primer", Pearson Ed.,2005.
2. Raj Kamal," Introduction Embedded Systems", TMS,2002.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 2 | | | | | | | | | | 2 | 2 |
| **CO2** | 2 | | 2 | | | | | | | | | | 2 | |
| **CO3** | 3 | 2 | | | | | | | | | | | 2 | 2 |
| **CO4** | | | | | | | | | | | | | | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.TECH I SEMESTER**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

## 20AMB10 INDUSTRIAL MARKETING (Common to All Branches)

**Course Outcomes**

After completion of the course, the students will be able to

CO1: Describe key concepts of industrial marketing.

CO2: Prepare proper segmentation and positioning for various industrial products.

CO3: Formulate robust marketing strategies for variety of situations in Indian and global context.

CO4: Apply and integrate Business-to-Business marketing theory with practice in a business context.

CO5: Explain the industrial marketing mix strategies apply this knowledge to real cases.

**UNIT-I:** The Industrial Marketing system and the Industrial Marketing concept, Industrial goods demand and product characteristics market levels and product types, the industrial customer, buyer motives business and institutional buyers.

**UNIT-II:** Organizational Buying: BUYGRID MODEL, phases in purchasing decision process & their marketing implications, Buying centers, value analysis & vendor analysis.

**UNIT-III:** Industrial market segmentation, bases for segmenting industrial market-macro and micro variables. Targeting the industrial product, positioning the industrial product. Industrial product life cycle, product mix, Service component the provision of parts, technical assistance, terms of sales.

**UNIT – IV:** The distribution channel component—Industrial distributors, Formulation of channel strategy-conditions influencing channel structure. Brief introduction to Marketing Logistics. The price component-conditions affecting price competition, cost factor, the nature of demand, pricing policies..

**UNIT –V:** The promotional component, advertising functions-establishing recognition, supporting and motivating salesmen and distributors measurement of advertising effectiveness. Personal selling-Personnel profiles selection and training, supervisions compensation sales promotion and public relations-Trade shows and exhibits, promotional novelties.

**TEXT BOOKS:**


1. Havaldar, K. K. (2005). Industrial Marketing: Text and Cases. India: Tata McGraw-Hill.
2. Phadtare, M. T. (2014). Industrial Marketing. India: PHI Learning.
3. Govindarajan, M. (2009). Industrial Marketing Management. India: Vikas Publishing House Pvt Limited.


**REFERENCES:**


1. Stacey, N., Wilson, A. (2014). Industrial Marketing Research (RLE Marketing): Management and Technique. United Kingdom: Routledge.
2. Chisnall, P. M. (1985). Strategic Industrial Marketing. United Kingdom: Prentice-Hall.
3. Brierty, E. G., Reeder, B. H., Reeder, R. R. (1991). Industrial Marketing: Analysis, Planning, and Control. United Kingdom: Prentice-Hall International.


| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | - | - | - | - | - | - | - | - | 1 | - | 1 | | |
| **CO2** | 2 | - | - | - | - | - | - | - | - | 1 | - | 1 | | 1 |
| **CO3** | - | 3 | 3 | 3 | 2 | - | - | - | - | - | - | - | 1 | |
| **CO4** | 2 | - | - | - | - | - | - | - | - | - | - | - | | |
| **CO5** | 2 | - | 2 | - | 2 | - | - | - | - | - | - | - | | 1 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

IV B. Tech I Semester

**20AME54 OPTIMIZATION TECHNIQUES**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

**COURSE OUTCOME:**

After Completion of the course the student will be able to:

CO1: Formulate unconstrained optimization techniques in the engineering application.

CO2: Formulate constrained optimization techniques for various applications.

CO3: Implement neural network technique and swarm optimization to real world design problems.

CO4: Apply genetic algorithms and multi objective optimization to the complex engineering problems.

CO5: Evaluate solutions by various optimization approaches for structural and dynamic problem.

**UNIT: I Unconstrained Optimization Techniques**

Introduction to optimum design - General principles of optimization – Problem formulation & their classifications - Single variable and multivariable optimization, Techniques of unconstrained minimization – Golden section, Random, pattern and gradient search methods – Interpolation methods.

**UNIT: II Constrained optimization techniques**

Optimization with equality and inequality constraints - Direct methods – Indirect methods using penalty functions, Lagrange multipliers - Geometric programming.

**UNIT: III Artificial Neural Networks and Swarm intelligence**

Introduction – Activation functions, types of activation functions, neural network architectures, Single Layer feed forward network, multilayer feed forward network, Neural network applications. Swarm intelligence - Various animal behaviors, Ant Colony optimization, and Particle Swarm optimization.

**UNIT: IV Advanced Optimization Techniques**

Multi stage optimization – dynamic programming; stochastic programming; Multi objective optimization, Genetic algorithms and Simulated Annealing technique.

**UNIT: V Static and Dynamic Applications**

Structural applications – Design of simple truss members – Design of simple axial, transverse loaded members for minimum cost, weight – Design of shafts and torsionally loaded members – Design of springs.

Dynamic Applications – Optimum design of single, two degree of freedom systems, vibration absorbers. Application in Mechanisms – Optimum design of simple linkage mechanisms.

**Text Book(s)**

1. Kalyanmoy Deb, "Optimization for Engineering Design: Algorithms and Examples", PHI Learning Private Limited, 2nd Edition, 2012.
2 Rao Singiresu S., "Engineering Optimization – Theory and Practice", New Age International Limited, New Delhi, 3rd Edition, 2013.
3 Rajasekaran S and VijayalakshmiPai, G.A, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2011

**Reference Books**

1 Goldberg, David .E, "Genetic Algorithms in Search, Optimization and Machine Learning", Pearson, 2009.
2 Srinivasan G, "Operations Research Principles and Applications", PHI, 2017.

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO-1 | 3 | 3 | 3 | 3 | | | | | | | | 3 | 3 | 2 |
| CO-2 | 3 | 3 | 3 | 2 | | | | | | | | 3 | 3 | 2 |
| CO-3 | 3 | 3 | 3 | 3 | | | | | | | | 3 | 3 | 2 |
| CO-4 | 3 | 3 | 3 | 3 | | | | | | | | 3 | 3 | 2 |
| CO-5 | 3 | 3 | 2 | 2 | | | | | | | | 1 | 3 | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.TECH I SEMESTER (Common to AI&ML)**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

### 20ACM26 MACHINE LEARNING TOOLS AND TECHNIQUES

**COURSE OUTCOMES**

After Completion of the course the student will be able to:

CO1: Describe the basics of Data mining process and machine learning models.
CO2: Use different knowledge representation techniques.
CO3: Apply different validation and selection models to improve the performance.
CO4: Analyze different machine learning tools for implement in great-world applications.

**UNIT I INTRODUCTION**

Fielded Applications, The Data Mining Process, Machine Learning and Statistics, Generalization as Search, Data Mining and Ethics, Input: concepts, instances, attributes, Preparing the Input, output: Knowledge representation-Tables, Linear Models, Trees, Rules, Instance-Based Representation, Clusters.

**UNIT II KNOWLEDGE REPRESENTATION**

Tables, Linear Models, Trees, Rules, Instance-Based Representation, Clusters, and Algorithms: the basic methods, Inferring Rudimentary Rules, Simple Probabilistic Modeling, And Divide-and-Conquer: Constructing Decision Trees, Covering Algorithms: Constructing Rules, Mining Association Rules, Linear Models, Instance-Based Learning, Clustering, and Multi-Instance Learning.

**UNIT III CREDIBILITY**

Training and Testing, Predicting Performance, Cross-Validation, Other Estimates, Hyper parameter Selection, Comparing Data Mining Schemes Predicting Probabilities, Counting the Cost, Evaluating Numeric Prediction, The Minimum Description Length Principle, Applying MDL to Clustering, using a Validation Set for Model Selection.

**UNIT IV TREES AND RULES**

Decision Trees, Classification Rules, Association Rules, extending instance-based and linear models- Instance-Based Learning, Extending Linear Models, Numeric Prediction with Local Linear Models, WEKA Implementations. Data transformations- Attribute Selection, Discretizing Numeric Attributes, Projections, Sampling, Cleansing, Transforming Multiple Classes to Binary Ones, Calibrating Class Probabilities.

**UNIT V MACHINE LEARNING TOOLS**

Knime, Accord. net, Scikit-Learn, Tensor Flow, Pytorch, Rapid Miner, Google Cloud Auto ML, Jupyter Notebook, Apache Mahout, Azure Machine Learning studio, MLLIB, Orange3, IBM Watson, Pylearn2

**TEXT/REFERENCEBOOKS**

1. Data mining machine learning tools and techniques, Chris Pal, Ian Witten, Eibe Frank ,Mark Hall, 2011.
2. Machine Learning the art of science and algorithms that make sense of data,peter,flach,2012.
3. Machine Learning for Absolute Beginners, OliverTheobald,2021.
4. InterpretableMachineLearning,ChristophMolnar,2020.
5. Data Mining: Practical Machine Learning Tools and Techniques, Ian H.Witten,Eibe Frank, Mark A. Hall,2011.

| | PO 1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 1 | | | | | | | | | 3 | |
| CO2 | 3 | 2 | 2 | | | | | | | | | 3 | 2 |
| CO3 | 3 | 1 | 1 | | | | | | | | | 2 | 2 |
| CO4 | 3 | 2 | 2 | | | | | | | | | 2 | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**(AUTONOMOUS)**

**IV B.Tech I SEM**

**20AIT29 SEMANTIC WEB**

**L T P C**
**3 0 0 3**

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1. Create ontology for a given domain.
CO2. Develop an application using ontology languages and tools.
CO3. Understand the concepts of semantic Web.
CO4. Use ontology related tools and technologies for application creation.
CO5. Design and develop applications using semantic web.

**UNIT I THE QUEST FOR SEMANTICS**

Building Models – Calculating with Knowledge – Exchanging Information – Semantic Web Technologies – Layers – Architecture – Components – Types – Ontological Commitments – Ontological Categories – Philosophical Background – Sample Knowledge Representation Ontologies – Top Level Ontologies – Linguistic Ontologies – Domain Ontologies – Semantic Web – Need – Foundation.

**UNIT II LANGUAGES FOR SEMANTIC WEB AND ONTOLOGIES**

Web Documents in XML – RDF – Schema – Web Resource Description using RDF – RDF Properties – Topic Maps and RDF – Overview – Syntax Structure – Semantics – Pragmatics –Traditional Ontology Languages – LOOM – OKBC – OCML – Flogic Ontology Markup Languages – SHOE – OIL – DAML+OIL – OWL.

**UNIT III ONTOLOGY LEARNING FOR SEMANTIC WEB**

Taxonomy for Ontology Learning – Layered Approach – Phases of Ontology Learning – Importing and Processing Ontologies and Documents – Ontology Learning Algorithms – Methods for evaluating Ontologies.

**UNIT IV ONTOLOGY MANAGEMENT AND TOOLS**

Overview – Need for management – Development process – Target Ontology – Ontology mapping – Skills management system – Ontological class – Constraints – Issues – Evolution –Development of Tools and Tool Suites – Ontology Merge Tools – Ontology based Annotation Tools.

**UNIT V APPLICATIONS**

Web Services – Semantic Web Services – Case Study for specific domain – Security issues – Web Data Exchange and Syndication – Semantic Wikis – Semantic Portals – Semantic Metadata in Data Formats – Semantic Web in Life Sciences – Ontologies for Standardizations – Rule Interchange Format.

**TEXT BOOK AND REFERENCES:**


1. Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, "Foundations of Semantic Web Technologies", Chapman & Hall/CRC, 2009.
2. Asuncion Gomez-Perez, Oscar Corcho, Mariano Fernandez-Lopez, "Ontological Engineering: with Examples from the Areas of Knowledge Management, eCommerce and the Semantic Web", Springer, 2004.
3. Grigoris Antoniou, Frank van Harmelen, "A Semantic Web Primer (Cooperative Information Systems)", MIT Press, 2004.
4. Alexander Maedche, "Ontology Learning for the Semantic Web", First Edition, Springer. 2002.
5. John Davies, Dieter Fensel, Frank Van Harmelen, "Towards the Semantic Web: Ontology Driven Knowledge Management", John Wiley, 2003.
6. John Davies, Rudi Studer, Paul Warren, (Editor), "Semantic Web Technologies: Trends and Research in Ontology-Based Systems", Wiley, 2006.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | - |
| C02 | 3 | 3 | 1 | - | - | - | - | - | - | - | 2 | - | 2 | - |
| C03 | 3 | 2 | 3 | - | 1 | - | - | - | - | - | 2 | 3 | 2 | - |
| C04 | - | 1 | 2 | 1 | 1 | - | - | - | - | - | - | 2 | - | 1 |
| C05 | - | - | - | 1 | 1 | - | - | - | - | - | - | 1 | - | 1 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Semester**

## 20AEC51 DIGITAL IMAGE PROCESSING

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

**Course Outcomes:**

**After successful completion of the course the student will be able to**

**CO1:** Explain fundamentals of Digital Image Processing

**CO2:** Analyze image transforms and enhancement

**CO3:** Apply various coding and segmentation techniques in image processing

**UNIT I FUNDAMENTALS OF DIGITAL IMAGE PROCESSING:**

Digital Image representation – Digital image processing System – Visual Perception-Sampling and Quantization - Basic relationships between pixels and imaging geometry.

**UNIT II IMAGETRANSFORMS:**

Discrete Fourier Transform – Properties of 2 – D Fourier Transform – Fast Fourier Transform, Walsh, Hadamard, Discrete cosine transforms.

**UNIT III IMAGE ENHANCEMENT:**

ImageEnhancementinSpatialDomain,EnhancementThroughPointOperation,TypesofPointOperation, Histogram Manipulation, gray level Transformation, local or neighborhood operation, medianfilter, spatial domain high-pass filtering, Enhancement in frequency Domain, Image smoothing, Image sharpening, Color images

**Image Restoration**: Degradation model, Algebraic approach to restoration – Inverse filtering– Least Mean Square filters, Constrained Least square restoration

**UNIT IV IMAGE CODING:**

Fidelity criteria, Image Compression Models, Huffman and Arithmetic Coding, Error Free Compression, Lossy Compression, Lossy and Lossless Predictive Coding, Transform Based Compression, JPEG 2000 Standards.

**UNIT-VIMAGESEGMENTATION:**

Detection of discontinuities. Edge linking and boundary detection, Thresholding, Region Oriented segmentation

**TEXTBOOKS:**

1. R.C.Gonzalez & R.E.Woods,“ Digital Image Processing”, Addison Wesley / Pearsoneducation,3rd Edition, 2010.
2. A.K. Jain,“ Fundamentals of Digital Image processing”, PHI.

**REFERENCE BOOKS:**

1. Rafael C.Gonzalez, Richard E woods and Steven L.Eddins,“ Digital Image processing using MATLAB”,Tata McGrawHill, 2010.
2. S Jayaraman, SEsakkirajan, T Veerakumar,“DigitalImageprocessing”,TataMcGrawHill.2010.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 1 | | | | | | | | | | 2 | |
| CO2 | 2 | 1 | 2 | 2 | | | | | | | | | 2 | 1 |
| CO3 | 3 | 1 | | | | | | | | | | | 2 | |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

## (Autonomous)

**IV B.Tech I Semester**

| L | T | P | C |
|---|---|---|---|
| 3 | | | 3 |

### 20AMB11 SOCIAL MEDIA MARKETING (Common to All Branches)

**COURSE OUTCOMES:**

After completion of the course, the students will be able to

CO1: Explain the required terminology and components of Social Media tactical and strategic plans.

CO2: Identify the place social media marketing has within the context of an organizations/business unit's/product's overall marketing strategy.

CO3: Evaluate an organizations effective engagement in social media to meet marketing objectives.

CO4: Measure the effectiveness of social media for marketing purposes and draft a social media strategy for a specific product.

CO5: Evaluate customer satisfaction level.

**UNIT I: INTRODUCTION:** Social Media, Historical Evolution of Social Media Marketing; Understanding the concept of Social Media; Increasing Visibility, Engagement; Bringing Targeted traffic; Converting traffic into leads; Understanding conversion process;

**UNIT II CONTENT MARKETING–I:** Developing a Content Marketing Strategy, Content Strategies-Building audience; Face book: Creating groups and pages - Posts – Events - Ad campaigns – Objective, Managing Audience, Budget, scheduling and Ad Delivery; Twitter: Micro blogging; Creating campaigns on Twitter –Clients- Set-up and usage – Tips.

**UNIT III: CONTENT MARKETING–II:** Blogs: Introduction – History – Blogging; Forums; Ratings and Reviews; Introduction to SEO: What is SEO? History and Growth of SEM; How it is determined? Introduction to Google Ad words and PPC; YouTube: Long-form video platforms- Setting up a channel - Managing content.

**UNIT–IV: TRENDS IN SOCIAL MEDIA MARKETING:** LinkedIn: Promoting Business with LinkedIn; Using LinkedIn as a Content Platform; Instagram: Create and Usage; Brand advertising on Instagram; Pinterest: Set-up and management – Driving traffic with Pinterest.

**UNIT-V: MEASURING RESULTS:** Metrics – Goal Setting; Analyzing Content-Sharing Metrics; Analyzing Twitter & Face book Metrics; Measuring Other Social Media Networks. ROI: Measuring ROI – Financial - Customer Satisfaction – Awareness.

**TEXT BOOKS:**

1. Jan Zimmerman, Deborah Ng, Social Media Marketing All-in-One For Dummies,3rd Edition, John Wiley and Sons, 2015.

2. Dan Zarella, The Social Media Marketing, O'Reilly Media, 2011, ISBN: 978-0-596-80660-

**REFERENCES:**

1. Erik Qualman, Socialnomics: How Social Media Transforms the Way We Live and Do Business -2nd Edition, 978-1118232651.

2. Eric Schwartzaman, Social Marketing to the Business Customer: Listen to Your B2B Market, Generate Major Account Leads, and Build Client Relationships, John Wiley & Sons, 978- 0470639337.

3. Dave Evans, Social Media Marketing, the Next Generation of Business Engagement.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | - | - | - | - | - | - | 3 | - | | |
| **CO2** | - | - | - | - | - | - | - | - | - | - | 3 | - | | 1 |
| **CO3** | - | - | - | - | - | - | - | - | - | - | 3 | - | 1 | |
| **CO4** | - | - | - | - | - | - | - | - | - | - | 3 | - | | 1 |
| **CO5** | - | - | - | - | - | - | - | - | - | - | 3 | - | | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B. Tech - I Semester**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

## 20AME20 TOTAL QUALITY MANAGEMENT & RELIABILITY ENGINEERING

**Course Outcome:**

After Completion of the course the student will be able to:

CO1: Develop action plans for customer centric business on the basis of various quality philosophies.
CO2: Select the best solution for problem solving using QC tools, QFD model, and JIT method.
CO3: Solve industry problems with available sources, software tools, and modern TQM techniques with system approach.
CO4: Establish quality management system and environmental management system for product and service industries.
CO5: Design systems with a focus on enhancing reliability and availability.

**UNIT I Introduction**

Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Costs of quality, Employee involvement, Quality Awards.

**UNIT II TQM Principles**

Quality circles - PDCA cycle, Control Charts - Process Capability – Problem solving - Quality Function Development (QFD) - Taguchi quality loss function – Total Productive Maintenance - Concepts, improvement needs - Performance measures. Poka-yoke, Kaizen , JIT, Tero technology.

**UNIT III TQM Tools and Technique**

The seven traditional tools of quality - New management tools - Six sigma: Concepts, DMAIC, Methodology, applications to manufacturing, service sector including IT - Bench marking -Reason to bench mark, Bench marking process - FMEA - Stages, Fault tree analysis.

**UNIT: IV Quality Systems**

Need for ISO 9000 - ISO 9001-2008 Quality System - Elements, Documentation, Accounting Systems, Quality Auditing - QS 9000 - ISO 14000 - Concepts, Requirements and Benefits - TQM Implementation in manufacturing and service sectors.

**UNIT: V Fundamental concepts of Reliability**

Reliability definitions, failure, failure density, failure Rate, hazard rate, Mean Time To Failure (MTTF), Mean Time Between Failure (MTBF), maintainability, availability, safety and reliability, product liability, importance of reliability. Problem solving. Business process re-engineering (BPR) –

Principles, applications.

**Textbooks**

1. Dale H. Besterfiled, et at., "Total quality Management", Third Edition, Pearson Education Asia, Indian Reprint, 2006
2. Dr.K.C.Arora, "Total Quality Management", 4th Edition, S. K. Kataria& Sons, 2009.

**Reference Books**

1. James R. Evans and William M. Lindsay, "The Management and Control of Quality", 8th Edition, First Indian Edition, Cengage Learning, 2012
2. Suganthi.L and Anand Samuel, "Total Quality Management", Prentice Hall (India) Pvt. Ltd.,2006.

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | | | | | 3 | 3 | | | | 1 | | 3 | 0 |
| CO2 | 3 | 3 | | | | 3 | 3 | | | | 1 | | 3 | 3 |
| CO3 | 3 | 3 | | | | 3 | 3 | | | | 1 | | 3 | 3 |
| CO4 | 3 | | | | | 3 | 3 | | | | 1 | | 3 | 3 |
| CO5 | 3 | | | | | 3 | 3 | | | | 1 | | 3 | 3 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.TECH I SEM** **L T P C**
**3 0 0 3**

## 2OAIT30 TCP/IP DESIGN AND IMPLEMENTATION

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1. Configure various network devices.
CO2. Explain the data structures of ARP, IP and TCP software design.
CO3. Analyze the routing of packets by routers using its table contents.
CO4. Interpret the states in the TCP module.
CO5. Justify the need for various Timers and transmission policies in TCP module.

UNIT I FUNDAMENTALS

TCP/IP Layering – internetworking devices and concepts – IP address classes – Network APIs – System Calls and Libraries – Memory buffer – Network Implementation Overview.

UNIT II ARP AND IP

Structure of TCP/IP in OS – Data Structures for ARP – Cache Design And Management – IP Software Design And Organization – Sending a Datagram to IP - Implementation of IP software module to perform the following: i. Forwarding of datagrams ( IP Forwarding algorithm) ii. Handling of incoming datagrams.

UNIT III IP ROUTING IMPLEMENTATION

Routing Table – Routing Algorithms – Fragmentation and Reassembly – Error Processing (ICMP) – Multicast Processing (IGMP). Suggested Activities: - Using packet tracer, design a network topology with n nodes and m routers, show the initial routing table contents of all the routers. Use any routing algorithm and show the updations in the routers.

UNITIV TCP I/O PROCESSING AND FSM

Data Structure and Input Processing – Transmission Control Blocks – Segment Format – Comparison – Finite State Machine Implementation – Output Processing – Mutual Exclusion – Computing TCP Data Length. Implementation of the data structure for TCP FSM states using any programming language. - Implementation of the data structure for TCP I/O processing using any programming language.

UNIT V TCP TIMER AND FLOW CONTROL

Timers – Events And Messages – Timer Process – Deleting and Inserting Timer Event – Flow Control and Adaptive Retransmission – Congestion Avoidance and Control – Urgent Data Processing and Push Function.

TEXT BOOKS:

1. Douglas E. Comer, “Internetworking with TCP/IP Principles, Protocols and Architecture”, Volume 1, Sixth Edition, Pearson Education, 2013.
2. Douglas E. Comer, “Internetworking with TCP/IP-Design, Implementation and Internals”, Volume II, Third Edition, Pearson Education, 1999.

REFERENCES:

1. W. Richard Stevens, “TCP/IP illustrated-The Protocols”, Volume I, Pearson Education, 2006.
2. W. Richard Stevens, “TCP/IP illustrated-The Implementation”, Volume II, Addison Wesley, 1995.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 2 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C02 | 3 | 3 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| C03 | 3 | 3 | 2 | 3 | 1 | - | - | - | - | - | - | - | 3 | 3 |
| C04 | 3 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 2 |
| CO5 | 3 | 3 | 2 | 2 | 1 | - | - | - | - | - | - | - | 2 | 3 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Semester (Common to CSE, IT)**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

### 20ACS48 VIRTUAL REALITY

**Course Outcomes:**

After Completion of the course the student will be able to:

CO1: Describe how VR systems work and list the applications of VR.
CO2: Use the design and implementation of the hardware that enables VR systems to be built.
CO3: Describe the system of human vision and its implication on perception and rendering.
CO4: Explain the concepts of motion and tracking in VR systems

**Unit I**

**Introduction:** What is Virtual Reality – Modern VR Experience – Bird's –Eye View –Hardware – Software – Human Physiology and Perception

**Unit II**

**The Geometry of Virtual Worlds:** Geometric Models - Changing Position and Orientation - Axis-Angle Representations of Rotation -Viewing Transformations - Chaining the Transformations

**The Physiology of Human Vision**: From the Cornea to Photoreceptors – From Photoreceptors to the Visual Cortex - eye movements - implications for VR.

**Unit III**

**Visual Perception:** Perception of Depth- Perception of Motion,- Perception of Color- Combining Sources of Information

**Visual Rendering**: Ray Tracing and Shading Models – Rasterization - Correcting Optical Distortions - Improving Latency and Frame Rates – Immersive Photos and Videos

**Unit IV**

**Motion in Real and Virtual Worlds:** Velocities and Accelerations - The Vestibular System - Physics in the Virtual World - Mismatched Motion and Vection

**Tracking**: Tracking 2D Orientation – Tracking 3D Orientations- Tracking Position and Orientation - Tracking Attached Bodies – 3D Scanning of Environments

**Unit V**

**Interaction:** Motor Programs and Remapping – Locomotion – Manipulation Social Interaction – Additional Interaction Mechanism

**Evaluating VR Systems and Experience:** Perception Training - Recommendations for Developers – Comfort and VR Sickness – Experiments on Human Subjects

**Text Books:**

1. Virtual Reality, Steven M. LaValle, Cambridge University Press, 2016

**Reference Books:**

1. Understanding Virtual Reality: Interface, Application and Design, William R Sherman and Alan B Craig, (The Morgan Kaufmann Series in Computer Graphics)". Morgan Kaufmann Publishers, San Francisco, CA, 2002
2. Developing Virtual Reality Applications: Foundations of Effective Design, Alan B Craig, William R Sherman and Jeffrey D Will, Morgan Kaufmann, 2009.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 2 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C02 | 3 | 3 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| C03 | 3 | 3 | 2 | 3 | 1 | - | - | - | - | - | - | - | 3 | 3 |
| C04 | 3 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 2 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
**(AUTONOMOUS)**

**IV B.Tech I SEM**

### 20AIT31 C# AND .NET PROGRAMMING

| L | T | P | C |
|---|---|---|---|
| 1 | 0 | 2 | 2 |

**Course Outcome:**

After Completion of the course the student will be able to:

CO1: Write various applications using C# Language in the .NET Framework.

CO2: Develop distributed applications using .NET Framework.

CO3: Create mobile applications using .NET compact Framework.

LIST OF EXPERIMENTS

1) Programs using delegates and Events

2) Programs using Windows, Forms, Controls

3) Programs for creating Menus, Status bar, Tool bar

4) Data Access with ADO.NET

5) Simple Web Page creations using ASP.NET

**TEXT BOOKS:**

1. Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson, Morgan Skinner . ―Professional C# 2012 and .NET 4.5, Wiley, 2012
2. Harsh Bhasin, ―Programming in C#, Oxford University Press, 2014.

**REFERENCES**


1. Ian Gariffiths, Mathew Adams, Jesse Liberty, ―Programming C# 4.0‖, OReilly, Fourth Edition, 2010.
2. Andrew Troelsen, Pro C# 5.0 and the .NET 4.5 Framework, Apress publication, 2012.
3. Andy Wigley, Daniel Moth, Peter Foot, ―Mobile Development Handbook, Microsoft Press, 2011.


| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C01** | **3** | **3** | **-** | **-** | **3** | **-** | **-** | **-** | **-** | **-** | **-** | **3** | **2** | **-** |
| **C02** | **3** | **2** | **-** | **-** | **3** | **1** | **-** | **-** | **-** | **3** | **-** | **3** | **2** | **-** |
| **C03** | **3** | **3** | **3** | **-** | **-** | **1** | **1** | **-** | **-** | **-** | **-** | **3** | **2** | **-** |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

## (Autonomous)

**IV B.TECH I SEMESTER**

| L | T | P | C |
|---|---|---|---|
| 2 | | 2 | |

**20AMB12 PROFESSIONAL ETHICS (Common to All Branches)**

**Course Outcomes:**

After completion of this course students will be able to:

CO1: Identify and analyze an ethical issue in the relevant field.
CO2: Apply specific ethical theories to current social issues.
CO3: Identify significant problems in contemporary professional ethics.
CO4: Explain the ethical roles of engineers in industry and society.
CO5: Explain moral and ethical obligations toward the environment.

**UNIT I INTRODUCTION:** Professionalism-models of professionalism-Ethics-Types of ethics and morality-Engineering ethics-Positive and negative faces of ethics-Responsibility for safety-Technology pessimism and perils of technological optimism.

**UNIT II ETHICAL CONCEPTS:** Human Values – morals-integrity-work ethics-Respect for others-respect for authority-conflicts of interests-moral dilemmas-honesty- courage-cooperation-valuing time-commitment-collegiality-loyalty-self -interest-Professional accountability-royalty-Problem of bribery, extortion and grease payments-problem of nepotism, excessive gifts-confidentiality-uses of ethical theories-Kohlberg's Theory- Gilligan`s Theory-Ethical codes of IEEE and Institution of Engineers.

**UNIT III ENGINEERS ROLE IN SAFETY:** Safety and risks-risk and costs-risk benefit analysis-Testing methods for safety-The promise of technology-Computer Technology Privacy-Social policy-Engineering standards-the standards care-Social and value dimensions of technology-communicating risk and public policy-occupational crime-professional rights and employee rights-whistle blowing.

**UNIT IV ROLES OF ENGINEERS:** Engineers as managers, Advisors, Consultants, Experts and witnesses- Engineers role in industry and society- models of professional roles-Theories about right action-paternalism-different business practices-Moral leadership- Cases - Bhopal gas tragedy, Nuclear power plant disasters.

**UNIT V ENVIRONMENTAL ETHICS:** Global Issues-Multinational corporations-Living in harmony with NATURE-Holistic technology-Eco friendly production system-sustainable technology and development-weapon development-Four orders of living, their interconnectedness-Eco system-Ozone depletion-pollution

**Text Books:**


1. Subramanian R, Professional Ethics,1st Edition, Oxford University Press. 2013.
2. Naagarazan , R.S., A Textbook on Professional Ethics and Human Values,1st edition, New Age International (P) Limited, Publishers New Delhi.,2014
3. R. R. Gaur, R. Sangal and G. P. Bagaria, Human Values and Professional Ethics:,EecelBooks,New Delhi.2010.


**Reference Books:**


1. Fundamentals of Ethics for scientists and Engineers, Edmond G Seebauer and Robert L. Barry, 1st edition Oxford University Press, 2008.
2. Professional Ethics and Human Values – M.Govindrajan, S.Natarajan and V.S. Senthil Kumar, PHI Learning Pvt. Ltd. Delhi.
3. Professional Ethics and Human Values: Prof. D.R. Kiran, TATA McGraw Hill Education, 2007.
4. Charles D Fleddermann, “Engineering Ethics”, Prentice Hall.
5. Charles E Harris, Micheal J Rabins, “Engineering Ethics, Cengage Learning.


| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | | | | | | | | | | | 2 | | |
| **CO2** | 3 | 2 | | 1 | 1 | | 1 | | | | 3 | 2 | 1 | |
| **CO3** | 3 | 2 | 1 | 1 | 1 | | 1 | | | | 3 | | | 1 |
| **CO4** | | | 1 | 3 | | 1 | | 3 | | | 3 | 2 | | |
| **CO5** | | | 1 | 3 | 1 | 1 | 1 | 3 | | | 3 | | | |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**II B.Tech II Semester-(Common to CSE ,IT)**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

**20ACS53** **REAL TIME SYSTEMS**

### Course Outcomes:

After Completion of the course the student will be able to:

1. Understand the features of Real Time System
2. Implement the different processor scheduling and Task assignment
3. Understand the various real time protocols
4. Analyze the difference between traditional and real time database

5 Demonstrate the function of real time system function using tools

### UNIT I 7 hrs

Introduction to real-time computing - Structure of a real-time system - Characterization of real-time systems and tasks - Performance measures

### UNIT II 7 hrs

Task Assignment and Scheduling -Task Assignment and Scheduling - Uniprocessor scheduling algorithms - Task assignment - Mode changes - Fault tolerant scheduling.

### UNIT III 8 hrs

Real Time Communication Real-time Communication - Network topologies and architecture issues - Protocols - Contention-based, token-based, polled bus - Fault tolerant routing.

### UNIT IV 8 hrs

Real Time Databases Real-time Databases - Transaction priorities and aborts - Concurrency control issues - Scheduling algorithms - Two-phase approach to improve predictability.

### UNIT V 7 hrs

Programming Languages and Tools Programming Languages and Tools - Hierarchical decomposition - Run-time error handling - Overloading - Timing specification - Recent trends and development

### Text books:

1. C. M. Krishna and Kang G. Shin, "Real-Time Systems", International Edition, McGraw Hill Companies, Inc., New York, 1997

### Reference books:

1. Rajib Mall, "Real-Time Systems: Theory and Practice", 1st edition, Pearson Education, 2012

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | | 1 | | | | | | | | | 3 | 2 |
| CO2 | 3 | | | 3 | | | | | | | | | 3 | 2 |
| CO3 | 3 | 3 | | 1 | | | | | | | | | 3 | 2 |
| CO4 | 3 | 3 | | | | | | | | | | | 3 | 3 |
| CO5 | 3 | 3 | 2 | 3 | | | | | | | | | | |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**II B.Tech II Semester-(Common to CSE ,IT)**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

### 20ACS55 ADVANCED DATABASES

**Course Outcomes:**

After Completion of the course the student will be able to:

1. Select the appropriate high performance database like parallel and distributed database
2. Represent the data using XML database for better interoperability
3. Represent the basics of new trends such as: XML in relational databases, spatial data, multimedia databases.
4. Design the process and optimize database transactions

**UNIT I** **8 hrs**

**Object Based Databases**: Overview - complex Data Types - Structured Types and Inheritance in SQL - Table Inheritance - Array and Multiset Types in SQL – Object-Identity and Reference Types in SQL - Implementing O-R features - Persistent Programming Languages - Object Relational Mapping - Object Oriented versus Object Relational.

**UNIT II** **9 hrs**

**XML:** Motivation - Structure of XML data - XML Document schema - Querying and Transformation - Application Program Interface to XML - Storage of XML data - XML applications.

**UNIT III** **8 hrs**

**Query processing:** Overview - Measures of Query Cost - Selection operating - sorting - Join operation - Other Operations - Evaluation of Expressions.

**Query Optimization**: Overview - Transformation of Relational Expressions - Estimating Statistics of Expressing Results - Choice of Evaluation plans - Materialized Views.

**UNIT IV** **9 hrs**

**Parallel Databases**: Introduction - I/O Parallelism - Interquery Parallelism – Interquery Parallelism- Interoperation Parallelism - Query Optimization - Design of Parallel Systems.

**Distributed Databases**: Homogenous and Heterogeneous Databases - Distributed data storage- Distributed Transactions - Commit Protocols - concurrency Control in Distributed Databases – Availability - Distributed Query Processing - Heterogeneous Distributed Databases - cloud Based Databases - Directory systems.

**UNITV** **8 hrs**

**Advanced Application development**: Performance Tuning - Performance Benchmarks - Other Issues in Application Development – Standardization.

**Spatial and Temporal Data and Mobility**: Motivation- Time in Databases - spatial and

Geographical Data - Multimedia Databases - Mobility and Personal databases.

## TEXT BOOKS:

1. Abraham Silbershatz, Henry F Korth, S Sudharshan, “Database System Concepts”, McGrawHill International Edition, Sixth Edition,2010.
2. R.Elmasri, S.B.Navathe, Somayajulu, Gupta, “Fundamentals of Database Systems”, Pearson Education, Fourth Edition, 2006.

## REFERENCE BOOKS:

1. C.J.Date, A.Kannan and S.Swamynathan, ”An Introduction to Database Systems”, Eighth Edition, Pearson Education,2006.
2. Raghu Ramakrishnan, Johannes Gehrke, “Database Management Systems”, McGraw Hill, Third Edition2004.
3. Thomas Cannolly and Carolyn Begg, “Database Systems, A Practical Approach to Design, Implementation and Management”, Third Edition, Pearson Education,2007.

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | **3** | | | | | | | | | | | | **1** | |
| **CO2** | **3** | **3** | **2** | | | | | | | | | | | **2** |
| **CO3** | **2** | **3** | **3** | | | | | | | | | | | |
| **CO4** | | **3** | **2** | | | | | | | | | | **3** | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**(AUTONOMOUS)**

**II B.Tech II Semester-CSE**

| L | P | T | C |
|---|---|---|---|
| 4 | 0 | 0 | 4 |

## 20ACS56 NATURAL LANGUAGE PROCESSING

## COURSE OUTCOMES:

After Completion of the course the student will be able to:

1. Understand the principles and Process the Human Languages Such as English and other Indian Languages using computers.
2. Creating CORPUS linguistics based on digestive approach (Text Corpus method) Demonstrate understanding of state-of-the-art algorithms and techniques for text-based processing of natural language with respect to morphology.
3. Perform POS tagging for a given natural language. Select a suitable language modeling technique based on the structure of the language.
4. Apply the syntactic and semantic correctness of sentences using grammars and labelling.
5. Develop Computational Methods for Real World Applications and explore deep learning based NLP

### UNIT I **7 hrs**

Introduction to various levels of natural language processing, Ambiguities and computational challenges in processing various natural languages. Introduction to Real life applications of NLP such as spell and grammar checkers, information extraction, question answering, and machine translation.

### UNIT II **8 hrs**

Character Encoding, Word Segmentation, Sentence Segmentation, Introduction to Corpora, Corpora Analysis.

Inflectional and Derivation Morphology, Morphological Analysis and Generation using finite state transducers.

### UNIT III **7 hrs**

Introduction to word types, POS Tagging, Maximum Entropy Models for POS tagging, Multi-word Expressions.The role of language models. Simple N-gram models. Estimating parameters and smoothing. Evaluating language models.

### UNIT IV **7 hrs**

Introduction to phrases, clauses and sentence structure, Shallow Parsing and Chunking, Shallow Parsing with Conditional Random Fields (CRF), Lexical Semantics, Word Sense Disambiguation, WordNet, Thematic Roles, Semantic Role Labelling with CRFs.

### UNIT V **8 hrs**

NL Interfaces, Text Summarization, Sentiment Analysis, Machine Translation, Question answering. Recent Trends in NLP

## Text Books:

1.Daniel Jurafsky and James H. Martin “Speech and Language Processing”, 3rd edition, Prentice Hall, 2009.

## Reference Books:

1. Chris Manning and HinrichSchütze, “Foundations of Statistical Natural Language Processing”, 2nd edition, MITPress Cambridge, MA, 2003.
2. NitinIndurkhya, Fred J. Damerau “Handbook of Natural Language Processing”, Second Edition, CRC Press, 2010.
3. James Allen “Natural Language Understanding”, Pearson Publication 8th Edition. 2012.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | P012 | PS01 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | | | | | | | | | | | | | 3 | 3 |
| CO2 | | | | | 3 | | | | | | 2 | | 3 | 3 |
| CO3 | | | | | | | 3 | | | | | | 3 | 3 |
| C04 | 3 | | | | | | | | | | | | 3 | 3 |
| C05 | | | | | | | 3 | | | | | | 3 | 3 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**II B.Tech II Semester**

| L | P | T | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

**20ACD40 REVERSE ENGINEERING**

### Course Outcomes:

After Completion of the course the student will be able to:

1. Understand the problem in the existing process.
2. Collect the large number of data/ information for the product.
3. Depth analyze of the products and extraction of real time data.
4. Understand the principles behind the design of the product, ways to redesign and improve the performance of the system.

### UNIT I

**Foundations:** Introduction to Reverse Engineering. Software Reverse Engineering: Reversing, Reversing Applications, Security-Related Reversing, Reversing Cryptographic Algorithms, Digital Rights Management, Reversing in Software Development, Evaluating Software Quality and Robustness, Low-Level Software. Levels of abstraction: Application level, Functional level, Structural level.

### UNIT II

**Reverse Engineering Methodology:** Detailed study of Reverse Engineering for Branch Specific learning Dissemble the existing selected artifact/ product/ component/ process/ system to study technical aspects and design detail, Reverse engineering in various computer software/ application,

CASE STUDY EIS Client Application, Implementation level.

### UNIT III

**Software Reverse Engineering:** Reverse engineering of software, Binary reverse engineering, Binary software techniques, Software classification, Source code, number of UML tools, Reverse engineering of Protocols.

### UNIT IV

**Reversing Tools:** Different Reversing Approaches, Debuggers, User-Mode Debuggers, Kernel-Mode Debuggers, System-Monitoring Tools, Patching Tools, Hex Workshop, Miscellaneous Reversing Tools, Executable-Dumping Tools.

UNITV

**Applied Reversing:** Reversing and Interoperability, Deciphering File Formats, Cryptex, Using Cryptex, Reversing Cryptex, The Password Verification Process, The Password Transformation Algorithm, Hashing the Password.

## TEXT BOOKS:

1. Abraham Silbershatz, Henry F Korth, S Sudharshan, "Database System Concepts", McGrawHill International Edition, SixthEdition,2010.
2. R.Elmasri, S.B.Navathe, Somayajulu, Gupta, "Fundamentals of Database Systems", Pearson Education, Fourth Edition,2006.

## REFERENCE BOOKS:

1. C.J.Date, A.Kannan and S.Swamynathan, "An Introduction to Database Systems", Eighth Edition, PearsonEducation,2006.
2. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", McGraw Hill, ThirdEdition2004.
3. Thomas Cannolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education, 2007.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | P012 | PS01 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | **2** | **2** | | | | | | | | | | | **2** | |
| **CO2** | **3** | **3** | | | | | | | | | | | | **3** |
| **CO3** | **3** | **3** | | | **3** | | | | | | | | **3** | |
| **C04** | **3** | **2** | **3** | | | | | | | | | | | **3** |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

# III B.Tech I SEM

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

## 20AIT34 - DIGITAL DESIGN AND PRACTICES

**COURSE OUTCOMES:**

CO1: Simplify Boolean functions using Karnaugh Map
CO2: Design and Analyze Combinational and Sequential Circuits
CO3: Design and implementation using Programmable Logic Devices
CO4: Write HDL code for combinational and Sequential Circuits
CO5: Understand the memory and programmable logic.

**UNIT I BOOLEAN ALGEBRA AND LOGIC GATES**

Number Systems – Arithmetic Operations – Binary Codes- Boolean Algebra and Logic Gates – Theorems and Properties of Boolean Algebra – Boolean Functions – Canonical and Standard Forms – Simplification of Boolean Functions using Karnaugh Map – Logic Gates – NAND and NOR Implementations.

**UNIT II COMBINATIONAL LOGIC**

Combinational Circuits – Analysis and Design Procedures – Binary Adder- Subtractor – Decimal Adder – Binary Multiplier – Magnitude Comparator – Decoders – Encoders – Multiplexers – Introduction to HDL – HDL Models of Combinational circuits.

**UNIT III SYNCHRONOUS SEQUENTIAL LOGIC**

Sequential Circuits – Storage Elements: Latches , Flip-Flops – Analysis of Clocked Sequential Circuits – State Reduction and Assignment – Design Procedure – Registers and Counters – HDL Models of Sequential Circuits.

**UNIT IV ASYNCHRONOUS SEQUENTIAL LOGIC**

Analysis and Design of Asynchronous Sequential Circuits – Reduction of State and Flow Tables – Race-free State Assignment – Hazards.

**UNIT V MEMORY AND PROGRAMMABLE LOGIC**

RAM – Memory Decoding – Error Detection and Correction – ROM – Programmable Logic Array – Programmable Array Logic – Sequential Programmable Devices.

**TEXT BOOK:**

1. M. Morris R. Mano, Michael D. Ciletti, ―Digital Design: With an Introduction to the Verilog HDL, VHDL, and SystemVerilog‖, 6th Edition, Pearson Education, 2017.
2. John F. Wakerly, Digital Design Principles and Practices, Fifth Edition, Pearson Education, 2017.

**REFERENCES:**

1. G. K. Kharate, Digital Electronics, Oxford University Press, 2010
2. Charles H. Roth Jr, Larry L. Kinney, Fundamentals of Logic Design, Sixth Edition, CENGAGE Learning, 2013
3. Donald D. Givone, Digital Principles and Design‖, Tata Mc Graw Hill, 2003.
4. Burgstahle, Sheryl, Principles to design practices, Harvard Education Press, 2008.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 2 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C02 | 2 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| C03 | 3 | 3 | 2 | 3 | 1 | - | - | - | - | - | - | - | 3 | 1 |
| C04 | 3 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 2 |
| CO5 | 3 | 3 | 2 | 2 | 1 | - | - | - | - | - | - | - | 2 | 3 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III BTECH I SEM (Common to DS)**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

## 20AIT35 - SENSOR NETWORKS

**Course Outcomes:**

After Completion of the course the student will be able to:

CO1: Understand the state-of-the-art research in the emerging subject of Ad Hoc andWireless Sensor Networks.
CO2: Solve the issues in real-time application development based on ASN.
CO3: Ability to conduct further research in the domain of ASN.
CO4: Understand Geocasting and its protocols.
CO5: Design and implement Adhoc networks and algorithms.

**UNIT I:**

Basics of Wireless: Sensors and Lower Layer Issues, Applications, Classification of sensor networks, Architecture of sensor network, Physical layer, MAC layer, Link layer, Routing Layer.

**UNIT II:**

Upper Layer Issues of WSN: Transport layer, High-level application layer support, Adapting to the Inherent dynamic nature of WSNs, Sensor Networks and mobile robots.

**UNIT III:**

Data Transmission: Broadcast Storm Problem, Rebroadcasting Schemes-Simple-flooding, Probability-based Methods, Area-based Methods Neighbor Knowledge-Based: SBA, Multipoint Relaying, AHBP. Multicasting: Tree-based: AMRIS, MAODV; Mesh-based: ODMRP, CAMP; Hybrid: AMRoute, MCEDAR.

**UNIT IV:**

Geocasting: Data-transmission Oriented-LBM; Route Creation Oriented-GeoTORA, MGR. TCP over Ad Hoc TCP protocol overview, TCP and MANETs, Solutions for TCP over Ad hoc

**UNIT-V:**

Introduction to Ad Hoc Networks: Characteristics of MANETs, Applications of MANETs and Challenges of MANETs. Routing in MANETs - Criteria for classification, Taxonomy of MANET routing algorithms, Topology- based routing algorithms-Proactive: DSDV; Reactive: DSR, AODV; Hybrid: ZRP; Position-based routing algorithms-Location Services-DREAM, Quorum-based; Forwarding Strategies: Greedy Packet, Restricted Directional Flooding-DREAM, LAR.

**TEXT BOOK:**

1. Ad Hoc and Sensor Networks – Theory and Applications, Carlos Corderio Dharma P. Aggarwal, World Scientific Publications, March 2006, ISBN – 981–256–681–3.
2. K. Sohraby Minoli and T. Zanti," Wireless Sensor Networks: Technology, Protocols, and Applications", John Wiley and Sons, March 2007

**REFERENCE BOOK:**

1. Wireless Sensor Networks: An Information Processing Approach, Feng Zhao, Leonidas Guibas, Elsevier Science, ISBN – 978-1-55860-914-3 (Morgan Kauffman).
2. H. Karl, and A. Willig, "Protocols and Architectures for Wireless Sensor Networks", John Wiley and Sons, October 2007.
3. C. S. Raghavendra, K.M. Sivalingam and T. Zanti," Wireless Sensor Networks", Springer Verlag, Sep. 2006.
4. E. H. Callaway, Jr. Auerbach," Wireless Sensor Networks: Architectures and Protocols", Aug. 2003.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | 2 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C02 | 3 | 1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| C03 | 2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 1 |
| CO4 | 3 | 1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| CO5 | 2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 1 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.TECH I SEMESTER**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

### 20AIT36- INTRUSION DETECTION

**COURSE OUTCOMES**

After Completion of the course the student will be able to:

CO1: Study the pre crime data mining techniques.

CO2: Be familiar with the searchable database.

CO3: Learn the clustering concepts using text mining.

CO4: Evaluate and analyze the intrusion detection, techniques and systems.

CO5: Learn to map the crime using clustering.

**UNIT 1 PRECRIME DATA MINING**: Behavioral Profiling, Rivers of Scraps, Data Mining, Investigative Data Warehousing, Link Analysis, Software Agents, Text Mining, Neural Networks, Machine Learning, Pre crime, Criminal Analysis and Data Mining, Profiling via Pattern Recognition, Calibrating Crime, Clustering Burglars: A Case Study

**UNIT 2 INVESTIGATIVE DATA WAREHOUSING:** Relevant Data, Data Testing, The Data Warehouse, Internet Data, XML, Data Preparation, Interrogating the Data, Data Integration, Security and Privacy, Choice Point: A Case Study, Tools for Data Preparation, Link Analysis: Visualizing Associations, Using Link Analysis Networks, Fighting Wireless Fraud with Link Analysis: A Case Study, Link Analysis Tools

**UNIT 3 TEXT MINING: CLUSTERING CONCEPTS:** Text Mining Definition, Working of Text Mining Work, Text Mining Applications, Searching for Clues in Aviation Crashes: A Case Study, Clustering News Stories: A Case Study, Text Mining for Deception, Text Mining Threats, Text Mining Tools

**UNIT 4 INTRUSION DETECTION: TECHNIQUES AND SYSTEMS:** Cybercrimes, Intrusion MOs, Intrusion Patterns, Anomaly Detection, Misuse Detection, Intrusion Detection Systems, Data Mining for Intrusion Detection: A Case Study from the Mitre Corporation, Types of IDSs, Misuse IDSs, Anomaly IDSs, Multiple-Based IDSs, Data Mining IDSs, Advanced IDSs, Forensic Considerations, Early Warning Systems

**UNIT 5 MAPPING CRIME: CLUSTERING CASE WORK:** Crime Maps, Interactive Crime GIS, Crime Clusters, Modeling the Behavior of Offenders Who Commit Serious Sexual Assaults: A Case Study, Decomposing Signatures Software, Computer Aided Tracking and Characterization of Homicides and Sexual Assaults (CATCH), Forensic Data Mining, Alien Intelligence, Weka tool: Introduction to WEKA, The Explorer – Getting started, Exploring the explorer.

**TEXT BOOKS**

1. Investigative Data Mining for Security and Criminal Detection, Jesús Mena, Butterworth Heinemann, Elsevier Science, 2003

2. Jiawei Han and MichelineKamber, ―Data Mining Concepts and Techniques, Third Edition, Elsevier, 2012.

**REFERENCEBOOKS**

1. Ian H. Witten and Eibe Frank, ―Data Mining: Practical Machine Learning Tools and Techniques, Elsevier, Second Edition.

2. Pawel Skrobanek,” intrusion detection systems”.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | | | | | | | | | | | | | |
| CO2 | | | 2 | | | 3 | | 1 | | 1 | 1 | | 1 | |
| CO3 | | | | | 2 | | 2 | | | | | | | |
| CO4 | 2 | | 1 | | | | | | 2 | | | 1 | | 2 |
| C05 | | | | | | 2 | | | | | 2 | | 2 | |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.TECH I SEMESTER**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

### 20AIT37 - CYBER SECURITY

**COURSE OUTCOMES**

After Completion of the course the student will be able to:

CO1 Understand and explain concepts of cyber security and cyber crime.

CO2 Apply common cryptographic techniques and controls for authentication and encryption.

CO3 Analyze the threats and protect any network by designing firewall.

CO4 Validate various attacks

CO5 Implement Intrusion Detection Systems.

**Unit I - Introduction to Cyber Security and Cyber crime**
Overview of Cyber Security- Introduction to Cyber Crime- Classification of Cyber Crimes-Reasons for Commission of Cyber Crimes - Malware and its types-Kinds of Cyber crime.

**Unit II - Cyber Security Fundamentals**
Network and Security Concepts-Information Assurance Fundamentals - Basic Cryptography - Symmetric Encryption - Public Key Encryption - Firewalls.

**Unit III - Attacker techniques and motivation**
Anti – forensics - Proxies and types - Detecting the Use of Proxies – VPN -Tunneling Techniques - Fraud Techniques - Threat Infrastructure.

**Unit IV - Exploitation and Malicious code**
Web Exploit Tools - Brute Force and Dictionary Attacks - Misdirection, Reconnaissance, and Disruption Method - Self-Replicating Malicious Code - Evading Detection and Elevating Privileges – Spyware - stealing Information and Exploitation.

**Unit V - Defence and analysis technique**
Memory Forensics – Honeypots - Malicious Code Naming - Automated Malicious Code Analysis Systems - Intrusion Detection Systems.

**TEXT BOOKS**

1. Dr. Jeetendra Pande, “Introduction to Cyber Security”, Uttarakhand Open University, 2017.
2. James Graham Richard Howard Ryan Olson, “Cyber Security Essentials”, Taylor & Francis Group, LLC, 2011.
3. Nelson Phillips and Enfinger Steuart, “Computer Forensics and Investigations”, Cengage Learning, New Delhi, 2009.
4. Kevin Mandia, Chris Prosise, Matt Pepe, “Incident Response and Computer Forensics”, Tata McGraw -Hill, New Delhi, 2006.

**REFERENCE BOOKS**

1. Robert M Slade, “Software Forensics”, Tata McGraw Hill, New Delhi, 2005.
2. Bernadette H Schell and Clemens Martin, “Cybercrime”, ABC – CLIO Inc, California, 2004.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 1 | 2 | | | | | | | | | | 1 | |
| CO2 | | | | | 3 | | | | 2 | | 1 | | | |
| CO3 | | 2 | | 2 | | 3 | | | | | | | | 2 |
| CO4 | | | | | 2 | 3 | 2 | | 2 | | | | | |
| C05 | | | | 2 | | | | | | | | | 1 | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
# (AUTONOMOUS)

**III B.TECH II SEM**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

## 20AIT38 - NEURAL NETWORKS AND DEEP LEARNING

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1 Create different neural networks of various architectures both feed forward and feed backward. and Perform the training of neural networks using various learning rules.

CO2 Perform the testing of neural networks and do the perform analysis of these networks for various pattern recognition applications.

CO3 Upon completion of the course, the students will be able to Understand basics of deep learning

CO4 Implement various deep learning models and Realign high dimensional data using reduction techniques

CO5 Analyze optimization and generalization in deep learning and Explore the deep learning applications

**UNIT - I Introduction**:

A Neural Network, Human Brain, Models of a Neuron, Neural Networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks Learning Process: Error Correction Learning, Memory Based Learning, Hebbian Learning, Competitive, Boltzmann Learning, Credit Assignment Problem, Memory, Adaption, Statistical Nature of the Learning Process

**UNIT - II Single Layer Perceptrons:**

Adaptive Filtering Problem, Unconstrained Organization Techniques, Linear Least Square Filters, Least Mean Square Algorithm, Learning Curves, Learning Rate Annealing Techniques, Perceptron –Convergence Theorem, Relation Between Perceptron and Bayes Classifier for a Gaussian Environment Multilayer Perceptron: Back Propagation Algorithm XOR Problem, Heuristics, Output Representation and Decision Rule, Computer Experiment, Feature Detection

**UNIT III INTRODUCTION**

Introduction to machine learning- Linear models (SVMs and Perceptrons, logistic regression)- Intro to Neural Nets: What a shallow network computes- Training a network: loss functions, back propagation and stochastic gradient descent- Neural networks as universal function approximates History of Deep Learning- A Probabilistic Theory of Deep Learning- Backpropagation and regularization, batch normalization- VC Dimension and Neural Nets-Deep Vs Shallow Networks-Convolutional Networks- Generative Adversarial Networks (GAN), Semi-supervised Learning

**UNIT IV DIMENTIONALITY REDUCTION**

Linear (PCA, LDA) and manifolds, metric learning - Auto encoders and dimensionality reduction in networks - Introduction to Convnet - Architectures – AlexNet, VGG, Inception, ResNet - Training a Convnet: weights initialization, batch normalization, hyperparameter optimization

**UNIT V OPTIMIZATION AND GENERALIZATION**

Optimization in deep learning– Non-convex optimization for deep networks- Stochastic Optimization- Generalization in neural networks- Spatial Transformer Networks- Recurrent networks, LSTM - Recurrent Neural Network Language Models- Word-Level RNNs & Deep Reinforcement Learning - Computational & Artificial Neuroscience

**TEXT BOOKS:**

1. Cosma Rohilla Shalizi, Advanced Data Analysis from an Elementary Point of View, 2015.

2. Deng & Yu, Deep Learning: Methods and Applications, Now Publishers, 2013.

**REFERENCE BOOKS:**

1. Ian Goodfellow, Yoshua Bengio, Aaron Courville, Deep Learning, MIT Press, 2016.

2. Michael Nielsen, Neural Networks and Deep Learning, Determination Press, 2015.

3. Hands-on machine learning with Scikit-learn Keras and TensorFlow by Aurelion Geron published by O` Reilley

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | | 2 | | | | 1 | | | | 1 | | 2 | |
| CO2 | | | | 3 | | | | | | 1 | | | | |
| CO3 | 1 | | | | | 2 | | | | | | | 2 | |
| CO4 | | | 2 | | 1 | | | 2 | | | 1 | | | |
| C05 | | 2 | | | | | 2 | | | 1 | | | 1 | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.TECH II SEM** **L T P C**
**3 1 0 4**

## 20AIT39 CONVERGENCE TECHNOLOGIES

**COURSE OUTCOMES:**
After Completion of the course the student will be able to:

1. Enumerate the functions and importance of internetworking.
2. Understand interoperability of advanced wireless technologies.
3. Familiarize in the convergence technologies in respect of network design and performance measures.
4. Develop software methodologies for Information Communication Technology.
5. Apply techniques of Convergence Technologies for typical applications.

### UNIT I INTRODUCTION

Evolution towards convergence: Next generation network concept - framework for examining next generation and evolving networks - examples of application of framework - enabling mobile network technologies - opportunities and threats to the mobile converging service market.

### UNIT II SWITCHING NETWORKSANDCONVERGENCE STANDARDS

Switching networks: Packet switched networks - Circuit switched networks; Convergence Standards: VOIP convergence - H.323 protocol - SIP - Media Gateway Control Protocol (MGCP)- MEGACO; Wireless standards: IEEE 802.11 - HYPERLAN - IEEE 802.16 – wireless ATM- wireless convergence - sensor networks - ZigBee and RFID.

### UNIT III IP TELEPHONY

IP Telephony : Network architecture - IP Voice - VoIP call signaling protocols - IP cablecom - media networking - broadband infrastructure - IP TV - cloud computing - interoperability among multicasting / broadcasting systems - QoS.

**UNIT IV SOFTWARE QUALITY**

Development of software methodologies for ICT: Software processes in the NGN framework – high level design and analysis methods - enterprise and business modeling notation - object and data definition language - dynamic modeling notations - component and interface notations – distributed systems - creating a unified framework.

**UNIT V ACTIVITIES BASED LEARNING**

Simulation of minimum (four) convergence technologies for various applications using related tools.

**TEXT BOOKS**


1. Hu Hanrahan, “Network Convergence: Services, Applications, Transport, and Operations Support”, John Wiley and Sons, 2007.
2. Jeffrey Bannister, Paul Mather and Sebastian Coope, “Convergence Technologies for 3G Networks”, John Wiley and Sons, 2008.
3. David Tung Chong Wong, Peng-Yong Kong, Ying-Chang Liang, Kee Chaing Chua and Jon W.Mark, “Wireless Broadband Networks”, John Wiley and Sons, 2009.
4. Vijay Garg, “Wireless Network Evolution: 2G to 3G”, Prentice Hall of India, 2001.


**REFERENCES:**


1. Jyh-Cheng Chen and Tao Zhang, “IP Based Next Generation Wireless Networks - Systems,Architecture and Protocols”, John Wiley and Sons, 2003.
2. Guillaume De La Roche, Andres Alayon Glazunov and Ben Allen, “LTE – Advanced and Next Generation Wireless Networks: Channel Modeling and Propagation”, John Wiley and Sons, 2013.
3. C. Siva Ram Murthy and B.S. Manoj, “Ad Hoc Wireless Network: Architectures and Protocols”, Pearson Education, 2007.
4. Jerry D. Gibson, “Multimedia Communications: Directions and Innovations”, Academic Press, 2000.

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO10 | PO11 | PO12 | PSO1 | PSO 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C01** | 3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| **C02** | 3 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| **C03** | 2 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | 2 | 1 |
| **C04** | 2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 1 |
| **C05** | 3 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III BTECH II SEM (Common to DS)** **L T P C**
**3 1 0 4**

## 20ACD12 - DATA VISUALIZATION TECHNIQUES

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1: Understand the principles of analysis of visual perception and pattern

CO2: Apply core skills for visual analysis and time series ranking

CO3: Apply visualization techniques for various data distribution and correlation

CO4: Design information dashboard and visual perception

CO5: Understand Designing Bullet Graphs.

**UNIT I CORE SKILLS FOR VISUAL ANALYSIS**

Information visualization – effective data analysis – traits of meaningful data – visual perception –making abstract data visible – building blocks of information visualization – analytical interaction – analytical navigation – optimal quantitative scales – reference lines and regions – trellises and crosstabs – multiple concurrent views – focus and context – details on demand – over-plotting reduction – analytical patterns – pattern examples.

**UNIT II TIME-SERIES, RANKING, AND DEVIATION ANALYSIS**

Time-series analysis – time-series patterns – time-series displays – time-series best practices – part-to-whole and ranking patterns – part-to-whole and ranking displays – best practices – deviation analysis – deviation analysis displays – deviation analysis best practices.

**UNIT III DISTRIBUTION, CORRELATION, AND MULTIVARIATE ANALYSIS**

Distribution analysis – describing distributions – distribution patterns – distribution displays – distribution analysis best practices – correlation analysis – describing correlations – correlation patterns – correlation displays – correlation analysis techniques and best practices – multivariate analysis – multivariate patterns – multivariate displays – multivariate analysis techniques and best practices.

**UNIT IV INFORMATION DASHBOARD DESIGN**

Information dashboard – Introduction– dashboard design issues and assessment of needs – Considerations for designing dashboard - visual perception – Achieving eloquence.

**UNIT V INFORMATION BULLET GRAPHS**

Advantages of Graphics _Library of Graphs – Designing Bullet Graphs – Designing Sparklines – Dashboard Display Media –Critical Design Practices – Putting it all together- Unveiling the dashboard.

**TEXT BOOK:**


1. Ben Fry, "Visualizing data: Exploring and explaining data with the processing environment", O'Reilly, 2008.
2. Edward R. Tufte, "The visual display of quantitative information", Second Edition, Graphics Press, 2001.


**REFERENCES:**


1. Gert H. N. Laursen and Jesper Thorlund, "Business Analytics for Managers: Taking business intelligence beyond reporting", Wiley, 2010.
2. Nathan Yau, "Data Points: Visualization that means something", Wiley, 2013.
3. Stephen Few, "Information dashboard design: Displaying data for at-a-glance monitoring", second edition, Analytics Press, 2013.
4. Stephen Few, "Now you see it: Simple Visualization techniques for quantitative analysis", Analytics Press, 2009.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | 2 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C02 | 3 | 1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| C03 | 2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 1 |
| C04 | 2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 1 |
| CO5 | 2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 1 |

**SRI VENKATESWARA COLLEGE O FENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**III B.Tech II SEM** **L T P C**
**3 1 0 4**

**20ACD42 - REINFORCEMENT LEARNING**

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

***CO1:***Define the key features of reinforcement learning that distinguishes it from AI and non- interactive machine learning

***CO2:***Given an application problem (e.g. from computer vision, robotics, etc), decide if it should be formulated as a RL problem; if yes be able to define it formally.

***CO3:***Implement in code common RL algorithms.

***CO4:***Describe multiple criteria for analyzing RL algorithms and evaluate algorithms on these metrics: e.g. regret, sample complexity, computational complexity, empirical performance, convergence, etc.

***CO5:***Describe the exploration vs exploitation challenge and compare and contrast at least two approaches for addressing this challenge.

**UNIT I**

**Introduction:** Reinforcement Learning, Examples, Elements of Reinforcement Learning, Limitations and Scope, An Extended Example: Tic-Tac-Toe. **Tabular Solution Methods**: Multi-armed Bandits, A k-armed Bandit Problem, Action-value Methods , The 10-armed Testbed , Incremental Implementation , Tracking a Non-stationary Problem , Optimistic Initial Values, Upper-Confidence-Bound Action Selection , Gradient Bandit Algorithms , Associative Search (Contextual Bandits).

**UNIT II**

**Finite Markov Decision Processes:** The Agent–Environment Interface, Goals and Rewards, Returns and Episodes, Unified Notation for Episodic and Continuing Tasks, Policies and Value Functions, Optimal Policies and Optimal Value Functions, Optimality and Approximation.

**UNIT III**

**Dynamic Programming:** Policy Evaluation (Prediction), Policy Improvement, Policy Iteration, Value Iteration, Asynchronous Dynamic Programming, Generalized Policy Iteration, Efficiency of Dynamic Programming.

**UNIT IV**

**Monte Carlo Methods**: Monte Carlo Prediction, Monte Carlo Estimation of Action Values, Monte Carlo Control, Monte Carlo Control without Exploring Starts, Off policy Prediction via Importance Sampling, Incremental Implementation, Off policy Monte Carlo Control, Discounting-aware Importance Sampling , Per-decision Importance Sampling.

**UNIT V**

**Temporal-Difference Learning:** TD Prediction, Advantages of TD Prediction Methods, Optimality of TD(0), Sarsa: On-policy TD Control, Q-learning: Off policy TD Control, Expected Sarsa, Maximization Bias and Double Learning, Games, Afterstates, and Other Special Cases.

**TEXT BOOKS:**

1. Reinforcement Learning: An Introduction, by Richard S. Sutton and Andrew G. Barto.

**REFERENCES:**

1. Reinforcement Learning: State-of-the-Art, Marco Wiering and Martijn van Otterlo, Eds.
2. Artificial Intelligence: A Modern Approach, Stuart J. Russell and Peter NorvigSons, 1996.
3. Deep Learning, Ian Goodfellow, Yoshua Bengio, and Aaron Courville
4. David Silver's course on Reinforcement Learning.

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C01** | 3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| **C02** | 3 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| **C03** | 2 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | 2 | 1 |
| **C04** | 2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 1 |
| **C05** | 3 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III YEAR I SEM**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

## 20AIT40 KNOWLEDGE ENGINEERING AND EXPERT SYSTEMS

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1 Understanding Search concepts

CO2 Applying search methods

CO3 Understanding Knowledge representations

CO4 Understanding about Learning.

CO5 Understanding Expert Systems

UNIT I

Problems and Search: What is Artificial Intelligence, The AI Problems, Defining the Problem as a State Space Search, Problem Characteristics Searching strategies – Generate and Test, Heuristic Search Techniques- Hill climbing– issues in hill climbing. Python-Introduction to Python- Lists Dictionaries &Tuples in Python- Python implementation of Hill Climbing.

UNIT II

Search Methods - Best First Search - Implementation in Python - OR Graphs, The A * Algorithm, Problem ReductionAND-OR Graphs, The AO* algorithm, Constraint Satisfaction. MINIMAX search procedure, Alpha–Beta pruning

UNIT III

Knowledge representation - Using Predicate logic - representing facts in logic, functions and predicates, Conversion to clause form, Resolution in propositional logic, Resolution in predicate logic, Unification. Representing Knowledge Using Rules: Procedural Versus Declarative knowledge, Logic Programming, Forward versus Backward Reasoning.

UNIT IV

Learning: What is learning, Rote learning, Learning by Taking Advice, Learning in Problem-solving, Learning from example: induction, Explanation-based learning.

Connectionist Models: Hopfield Networks, Learning in Neural Networks, Applications of Neural Networks, Recurrent Networks. Connectionist AI and Symbolic AI

UNIT IV

Expert System –Representing and using Domain Knowledge – Reasoning with knowledge–Expert System Shells –Support for explanation- examples –Knowledge acquisition-examples.

**TEXT BOOKS:**

1. Elaine Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw-Hill Publishing Company Ltd., New Delhi, Third Edition, ISBN: 13:978-0-07-008770-5, 2010.
2. Stuart Russell, Peter Norvig, “Artificial Intelligence- A modern approach”, Pearson Education Asia, Second Edition, ISBN:81-297-0041-7

**REFERENCES:**

1. Akshar Bharati, Vineet Chaitanya, Rajeev Sangal, “Natural Language Processing: A Paninian Perspective”, Prentice Hall India Ltd., New Delhi, 1996, ISBN 10: 8120309219
2. Amit Konar, Artificial Intelligence and Soft Computing, CRC Press.
3. Dan W.Patterson, “Introduction to Artificial Intelligence and Expert Systems”, Prentice Hall India Ltd., New Delhi, 2009, ISBN: 81-203-0777-1.
4. Rajendra Akerkar, Introduction to Artificial Intelligence, PHI Learning Pvt. Ltd., 2005, ISBN: 81-203- 2864-7.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | | | | | | | | | | | | | |
| CO2 | | | 2 | | | 3 | | 1 | | 1 | 1 | | 1 | |
| CO3 | | | | | 2 | | 2 | | | | | | | |
| CO4 | 2 | | 1 | | | | | | 2 | | | 1 | | 2 |
| C05 | | | | | | 2 | | | | | 2 | | 2 | |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**III B.TECH II SEMESTER**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

**20AIT41 CYBER PHYSICAL SYSTEM**

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1. Apply embedded system concepts to solve real-world problems.

CO2. Design solutions to automated systems to make life easier.

CO3. Apply concepts of embedded systems and micro controllers to enhance Existing systems.

CO4. Understand to develop concepts, and logic toward solving unknown Problem in research and industry.

**UNIT-1 Introduction:** Cyber-Physical System, Key Features of CPS, Application Domains of CPS, Basic principles of design and validation of CPS, Challenges in CPS.

**UNIT-2**
**CPSPlatformcomponents:CPS**HWplatforms,Processors,SensorsandActuators,CPSNetwork-Wireless, CAN, Automotive Ethernet, Scheduling Real-Time CPS tasks, Synchronous Model and Asynchronous Model.

**UNIT-3SynchronousandAsynchronousModel:**ReactiveComponents,ComponentsProperties,ComponentsComposing,SynchronousDesignsandCircuits,AsynchronousProcessesand operations,DesignPrimitivesinAsynchronousProcess,CoordinationProtocolsinAsynchronousProcess,LeaderElection,Reliable Transmission.

**UNIT-4 Security of Cyber-Physical Systems:** Introduction to CPS Securities, Basic Techniques in CPS Securities, Cyber Security Requirements, Attack Model and Counter measures, Advanced Techniques in CPS Securities.

**UNIT-5 CPS Application:** Health care and Medical Cyber-Physical Systems, Smart grid and Energy Cyber-Physical Systems, WSN based Cyber-Physical Systems, Smart Cities.

**Text/References Books:**


3. E.A.LeeandS.A.Seshia,“IntroductiontoEmbeddedSystems:ACyber-PhysicalSystemsApproach”,2011.
4. R.Alur,“PrinciplesofCyber-PhysicalSystems,”MITPress,2015.

**References:**

- Publications, 2006. Cloud Computing (Principles and Paradigms), Edited by Rajkumar Buyya, James Broberg, Andrzej Goscinski, John Wiley & Sons, Inc.
- Raj Rajkumar, Dionisio de Niz and Mark Klein, "Cyber-Physical Systems", Addison-Wesley,2017
- RajeevAlur,"PrinciplesofCyber-PhysicalSystems",MITPress,2015
- FeiHu,"Cyber-PhysicalSystems",CRCPress2013

| PO<br>CO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO-1 | PSO-2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 3 | 3 | 2 | - | - | - | - | 3 | - | - | - | 3 | 2 |
| CO2 | 2 | 3 | - | - | - | - | - | - | 3 | - | - | - | 2 | 3 |
| CO3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 1 | 3 |
| CO4 | 3 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 |
| CO5 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 3 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.Tech II SEM**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

### 20AIT42 - OPEN SOURCE PROGRAMMING

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1 Differentiate between open source software and free software
CO2 Build applications software using Open Source Software
CO3 Demonstrate the knowledge of fundamental concepts related to open source technologies.
CO4 Demonstrate the knowledge of fundamental concepts using open source databases.
CO5 Provide solutions to reliability, security, scalability and robustness in Internet.

**UNIT I OSS FUNDAMENTALS**:
FOSS- Open Source Philosophy -OSD – Licensing - Open Source vs Closed Source– Open Source vs Free Software – Copyright Vs. Copy left.

**UNIT IIOPEN SOURCE TECHNOLOGIES:**
Open Source Servers – browsers – packages. **Basic PHP** Installation & Setting Path -Overview - Basics - GUI Programming - Arrays - Functions – Files Exception Handling

**UNIT III OPEN SOURCE DATA BASE**
Introduction to MYSQL -Data types - Queries-Interfaces with PHP

**UNIT IV ADVANCED PHP**
OOPs – File Uploading - Regular Expressions - Sending Mail – Cookies – Session Handling

**UNIT V PERL**
Introduction – Statements – Arrays – Strings – File Handling. **Tools for OSS**

Moodle: Installation – Themes – Course & Activity – File Uploading. Ecllipse - IDE PHP: Creating Project – Adding files to Repository – Parsing functionality – Executing the project. Introduction to R-Programming

**TEXT BOOKS:**


1. Micheal K. Glass, Rommnle Scouarnec, Beginning PHP, Apache, MYSQL Web Development, Wiley Dream Tech publishing Inc. New Delhi 2010.

2. William Rice, Moodle E-learning Course Development, Packt Publishing, Third Edition 2015.

**REFERENCE BOOKS:**

1. Larry Wall, Tom Christiansen & Randal L. Schwartz, Programming Perl, Fourth Edition, O’Reilly, 2012.
2. Gosselin, Diana Kokoska, Robert Easter Brooks, PHP Programming with MySQL, Second Edition, Course Technology, 2010.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | | | | | | | | | | | | | |
| CO2 | | | 2 | | | 3 | | 1 | | 1 | 1 | | 1 | |
| CO3 | | | | | 2 | | 2 | | | | | | | |
| CO4 | 2 | | 1 | | | | | | 2 | | | 1 | | 2 |
| C05 | | | | | | 2 | | | | | 2 | | 2 | |

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester , (Common to CSE,IT)

| | L | T | P | C |
|---|---|---|---|---|
| | 3 | 1 | - | 4 |

20ACS67 SPEECH PROCESSING

COURSE OUTCOMES:

After Completion of the course the student will be able to:

1. Create new algorithms with speech processing
2. Derive new speech models
3. Perform various language phonetic analysis
4. Create a new speech identification system
5. Generate a new speech recognition system

UNIT I 9 Hrs

Introduction – Regular Expressions, Text Normalization, Edit Distance - Regular Expressions -Words - Corpora - Text Normalization - Minimum Edit Distance.

UNIT II 9 Hrs

N- Gram Language Models: N-Grams - Evaluating Language Models - Generalization and Zeros –Smoothing - Kneser-Ney Smoothing

Naive Bayes and Sentiment Classification: Naive Bayes Classifiers - Training the Naive Bayes Classifier - Worked example - Optimizing for Sentiment Analysis - Naive Bayes for other text classification tasks - Naive Bayes as a Language Model

UNIT III 9 Hrs

Logistic Regression: Classification: the sigmoid - Learning in Logistic Regression -The cross- entropy loss function - Gradient Descent – Regularization - Multinomial logistic regression - Interpreting models

UNIT IV 9 Hrs

Neural Networks and Neural Language Models: Units - The XOR problem - Feed-Forward NeuralNetworks - Training Neural Nets - Neural Language Models

Sequence Labeling for Parts of Speech and Named Entities: English Word Classes - Part-of- Speech Tagging - Named Entities and Named Entity Tagging - HMM Part-of-Speech Tagging - Conditional Random Fields (CRFs) - Evaluation of Named Entity Recognition

UNIT V 9 Hrs

Language Models Revisited: Recurrent Neural Networks - Managing Context in RNNs: LSTMsand GRUs - Self-Attention Networks: Transformers - Potential Harms from Language Models

TEXT BOOK:

1. Daniel Jurafsky and James H. Martin, ― Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition, Person education,2013.

REFERENCE BOOKS:

**1.** Kai-Fu Lee, ―Automatic Speech Recognition, The Springer International Series in Engineeringand Computer Science, 1999.

**2.** Himanshu Chaurasiya, ―Soft Computing Implementation of Automatic Speech Recognition, LAPLambert Academic Publishing, 2010.

**3.** Claudio Becchetti, Klucio Prina Ricotti, ―Speech Recognition: Theory and C++implementa

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 2 | 3 |
| CO2 | 3 | 2 | 3 | 3 | - | - | - | - | - | - | - | - | 3 | 3 |
| CO3 | 3 | 2 | 1 | 1 | - | - | - | - | - | - | 1 | - | 3 | 2 |
| CO4 | 3 | - | 2 | - | 2 | - | - | - | - | 1 | - | - | 2 | 3 |
| CO5 | 2 | 3 | 3 | - | 2 | - | - | - | - | - | - | - | 3 | 2 |

# SRI VENKATESHWARA COLLEGEOF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I SEM.** **L T P C**

**3 1 0 4**

## 20AIT43 DATA VISUALIZATION WITH TABLEAU

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO 1Understand and describe the main concepts of data visualization.

CO2 Create ad-hoc reports, data visualization and dashboards using Tableau desktop.

CO3 Publish the created visualization to Tableau server and Tableau public.

**UNIT I**

Fundamentals of visualization with Tableau –Introduction to Tableau – Debug and troubleshoot– installation and configuration of the software – Configuring data environment – connecting to data – Data types and defaults – Alias and names – Data Visualization concepts.

**UNIT II**

Design principles – creating visualization with tableau – workflow exploratory visualization – Data joins Sorting, Top N button N – Filtering – Maps – Best practices.

**UNIT III**

Introduction – Visual Analysis –Optimal visualization types – Binning values – calculated fields – Table Calculation – level of detail calculations.

**UNIT IV**

Dashboard design principles – Dashboard development – Dashboard interactivity – connected “drill – down” dashboards.

**UNIT V**

Stakeholder categories – Receiving Feedback – creating analytical products – principles –performing design iteration – Advanced Tableau – Large datasets – Fiscal year calculation parameters.

**TEXT BOOKS**

1. Stephen Few, “Designing Tables and Graphs to Enlighten”.

2. Steve wexler, Jeffrey Shaffer and Andy cotgreave, “Visualizing data using real world business-Dashboards”.

**REFERENCES:**


1. Stephen Few, "The dataloom weaving by thinking critically and scientifically with data".
2. Tableau Desktop: Install the free version of Tableau for class here http://www.Tableau.com/academic/students.
5. http://canvas.usu.edu.
6. Service desk@usu.edu.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C02 | 3 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| C03 | 2 | 1 | 3 | 1 | 1 | - | - | - | - | - | - | - | 2 | 3 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV YEAR B.TECH I SEMESTER**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

### 20AIT44 COMPUTER FORENSICS

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

CO1 Understand the basics of computer forensics

CO2 Apply a number of different computer forensic tools to a given scenario

CO3 Analyze and validate forensics data

CO4 Identify the vulnerabilities in a given network infrastructure

CO5 Implement real-world hacking techniques to test system security

**UNIT I INTRODUCTION TO COMPUTER FORENSICS** **9**

Introduction to Traditional Computer Crime, Traditional problems associated with Computer Crime. Introduction to Identity Theft & Identity Fraud. Types of CF techniques - Incident and incident response methodology - Forensic duplication and investigation. Preparation for IR: Creating response tool kit and IR team. - Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition.

**UNIT II EVIDENCE COLLECTION AND FORENSICS TOOLS**

Processing Crime and Incident Scenes – Working with Windows and DOS Systems. Current Computer Forensics Tools: Software/ Hardware Tools.

**UNIT III ANALYSIS AND VALIDATION**

Validating Forensics Data – Data Hiding Techniques – Performing Remote Acquisition – Network Forensics – Email Investigations – Cell Phone and Mobile Devices Forensics

**UNIT IV ETHICAL HACKING**

Introduction to Ethical Hacking - Footprinting and Reconnaissance - Scanning Networks - Enumeration - System Hacking - Malware Threats - Sniffing

**UNIT V ETHICAL HACKING IN WEB**

Social Engineering - Denial of Service - Session Hijacking - Hacking Web servers - Hacking Web Applications – SQL Injection - Hacking Wireless Networks - Hacking Mobile Platforms.

**TEXT BOOKS:**

1. Bill Nelson, Amelia Phillips, Frank Enfinger, Christopher Steuart, ―Computer Forensics and Investigations‖, Cengage Learning, India Edition, 2016.
2. CEH official Certfied Ethical Hacking Review Guide, Wiley India Edition, 2015.

**REFERENCES**

1. John R.Vacca, ―Computer Forensics‖, Cengage Learning, 2005
2. MarjieT.Britz, ―Computer Forensics and Cyber Crime: An Introduction‖, 3rd Edition, Prentice Hall, 2013.
3. AnkitFadia ― Ethical Hacking‖ Second Edition, Macmillan India Ltd, 2006
4. Kenneth C.Brancik ―Insider Computer Fraud Auerbach Publications Taylor & Francis Group–2008.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | | | | | | | | | | | | | |
| CO2 | | | 2 | | | 3 | | 1 | | 1 | 1 | | 1 | |
| CO3 | | | | | 2 | | 2 | | | | | | | |
| CO4 | 2 | | 1 | | | | | | 2 | | | 1 | | 2 |

# SRI VENKATESHWARA COLLEGEOF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Sem.** **L T P C**
**3 1 0 4**

## 20AIT45 BIGDATA ANALYTICS WITH PY SPARK

**COURSE OUTCOMES:**
After Completion of the course the student will be able to:

CO1:Understand big data and its analytics in the real world with spark shell.

CO2:Analyze the big data framework like No SQL to efficiently store and process big data to generate analytics.
CO3:Design of algorithms to solve spark SQL using Map Reduce paradigms.
CO4:Develop clustering techniques and machine learning with spark.
CO5:Implementation of graph processing with spark.

**UNIT I**

**Interactive data analysis with spark shell:** Spark – Introduction– Ecosystem Components Spark Basics – Features and Use Cases – SparkContext – Stage – Executor.

**UNIT II**

**Spark Streaming with cluster managers:** Spark Streaming – Introduction – DStream – Transformations – Checkpointing – Batch vs Real Time.

**UNIT III**

**Spark SQL and Monitoring Spark core:** Definition and key points – Introduce Datasets/DataFrames – Different ways of interacting (typesafe or not, SQL strings or methods) – Joins. **Monitoring Spark core**: In-Memory Computation – Directed Acyclic Graph – Cluster Managers – Performance Tuning – RDD vs DataFrame vs DataSet
.

**UNIT IV**

**Machine learning with Spark:** MLlib– Basic approach – Statistics – Regression – Classification – Clustering – Collaborative Filtering.

**UNIT V**

**Graph Processing with Spark:** GraphX – Key points – Major algorithms – Basics of Cluster Setup.

**TEXT BOOKS**

3. Big Data Analytics with Spark “A Practitioner's Guide to Using Spark for Large Scale Data Analysis” by mohammedguller 1st edition 2015.
4. **Seema Acharya**, SubhashiniChellappan, “**Big Data** and **Analytics**”, Wiley Publications, First edition.

**REFERENCES:**


5. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, “Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data”, McGrawHill Publishing, 2012.
6. Zikopoulos, Paul, Chris Eaton, Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, Tata McGraw Hill Publications, 2011.
7. The Definitive Guide Big Data Processing Made Simple Bill Chambers and MateiZaharia.
8. High Performance Spark: Best Practices for Scaling and Optimizing Apache Spark

by Holden Karau & Rachel Warren.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 |
| C02 | 3 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| C03 | 2 | 1 | 3 | 1 | 1 | - | - | - | - | - | - | - | 2 | 3 |
| C04 | 2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | 3 |
| C05 | 3 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |

## SRI VENKATESHWARA COLLEGEOF ENGINEERINGAND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Sem. (Common to CSE,IT)**

**L T P C**
**3 1 0 4**

### 20ACS23 SOCIAL NETWORK ANALYSIS

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

1. Apply knowledge for current Web development in the era of social Web
2. Model, aggregate and represent knowledge for Semantic Web
3. Use machine learning approaches for Web Content Mining
4. Design extraction and mining tools for Social networks
5. Develop personalized web sites and visualization for Social networks

**UNIT I INTRODUCTION TO SOCIAL NETWORK ANALYSIS AND KNOWLEDGE REPRESENTATION**

Introduction to Web - Limitations of current Web – Development of Semantic Web – Emergence of the Social Web - Network analysis - Development of Social Network Analysis - Key concepts and measures in network analysis- Knowledge Representation on the Semantic Web – Ontology languages for the Semantic Web – RDF and OWL - Modeling and aggregating social network data.

**UNIT II SOCIAL MEDIA MINING**

Data Mining Essential –Data Mining Algorithm - Web Content Mining – Supervised Learning – Decision tree - Naïve Bayesian Text Classification - Support Vector Machines - Ensemble of Classifiers. Unsupervised Learning - K-means Clustering - Hierarchical Clustering –Partially Supervised Learning – Markov Models - Probability-Based Clustering - Classification and Clustering – Vector Space Model – Latent semantic Indexing – Automatic Topic Extraction - Opinion Mining and Sentiment Analysis – Document Sentiment Classification

**UNIT III EXTRACTION AND MINING COMMUNITITES IN WEB SOCIAL NETWROKS**

Extracting evolution of Web Community from a Series of Web Archive - Detecting Communities in Social Networks - Definition of Community - Evaluating Communities - Methods for Community Detection & Mining - Applications of Community Mining Algorithms - Tools for Detecting Communities Social Network Infrastructures and Communities - Decentralized Online Social Networks- Multi Relational Characterization of Dynamic Social Network Communities

**UNIT IV HUMAN BEHAVIOR ANALYSIS AND PRIVACY ISSUES**

Understanding and Predicting Human Behavior for Social Communities - User Data Management, Inference and Distribution - Enabling New Human Experiences - Reality Mining - Context-Awareness - Privacy in Online Social Networks - Trust in Online Environment - Trust Models Based on Subjective Logic - Trust Network Analysis - Trust Transitivity Analysis - Combining Trust and Reputation – Trust Derivation Based on Trust Comparisons - Attack Spectrum and Countermeasures.

**UNIT V VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS**

Graph Theory- Centrality- Clustering - Node-Edge Diagrams, Matrix representation, Visualizing Online Social Networks, Visualizing Social Networks with Matrix-Based Representations- Matrix +Node-Link Diagrams, Hybrid Representations - Applications - Covert Networks - Community Welfare - Collaboration Networks - Co-Citation Networks- Recommendation in Social Media: Challenges Classical Recommendation Algorithms-Recommendation Using Social Context-Evaluating Recommendations.

**TEXT BOOKS:**

1. Bing Liu, ―Web Data Mining: Exploring Hyperlinks, Contents, and Usage Data (DataCentric Systems and Applications)‖, Springer; Second Edition, 2011.
2. Borko Furht, ―Handbook of Social Network Technologies and Applications‖, Springer, 2010.
3. Dion Goh and Schubert Foo, ―Social information retrieval systems: emerging technologies and Applications for searching the Web effectively‖, Idea Group, 2007.

REFERENCE BOOKS:

1.Guandong Xu, Yanchun Zhang and Lin Li, ―Web Mining and Social Networking Techniques and applications‖, Springer, 2011.
2.John G. Breslin, Alexandre Passant and Stefan Decker, ―The Social Semantic Web‖, Springer, 2010.
3. Max Chevalier, Christine Julien and Chantal Soulé-Dupuy, ―Collaborative and social Information retrieval and access: Techniques for Improved User Modelling‖, Information Science Reference, 2009.
4. Peter Mika, ―Social networks and the Semantic Web‖, Springer, 2007. 8. Reza Zafarani, Mohammad Ali Abbasi, Huan Liu, ‖Social Media Mining‖, Cambridge University Press, 2014.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 2 | | | | | 2 | | | | | | | 2 |
| CO2 | | | 3 | | | | | 2 | | | 1 | | | |
| CO3 | 1 | 2 | | | | | | | | | | | | |
| CO4 | | 2 | | | | 2 | | 3 | 2 | | | | 1 | |
| C05 | 2 | | | 2 | | | | | | | 1 | | | 1 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**II B.Tech II Semester-CSE**

| L | P | T | C |
|---|---|---|---|
| 3 | 1 | - | 4 |

**20ACS73 FUNDAMENTALS OF BLOCK CHAIN**

### Course Outcomes:

After Completion of the course the student will be able to

1. Familiarize the functional/operational aspects of cryptocurrency ECOSYSTEM.
2. Understand emerging abstract models for Block chain Technology.
3. Identify major research challenges and technical gaps existing between theory and practice in cryptocurrency domain

### UNIT I — 8 hrs

**The consensus problem** - Asynchronous Byzantine Agreement - AAP protocol and its analysis - Nakamoto Consensus on permission-less, nameless, peer-to-peer network - Abstract Models for BLOCKCHAIN - GARAY model - RLA Model - Proof of Work ( PoW) as random oracle - formal treatment of consistency, liveness and fairness - Proof of Stake ( PoS) based Chains - Hybrid models ( PoW + PoS) .

### UNIT II — 7 hrs

cryptographic basics for cryptocurrency - a short overview of Hashing, signature schemes, encryption schemes and elliptic curve cryptography

### UNIT III — 9 hrs

Bitcoin - Wallet - Blocks - Merkley Tree - hardness of mining - transaction verifiability - anonymity - forks - double spending - mathematical analysis of properties of Bitcoin.

### UNIT IV — 7 hrs

Ethereum - Ethereum Virtual Machine ( EVM) - Wallets for Ethereum - Solidity - Smart Contracts - some attacks on smart contracts.

### UNIT V — 7 hrs

Zero Knowledge proofs and protocols in Blockchain - Succinct non interactive argument for Knowledge ( SNARK) - pairing on Elliptic curves - Zcash.

### TEXT BOOKS:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press, 2016.

### REFERENCE BOOKS:

1. Joseph Bonneau et al, SoK: Research perspectives and challenges for Bitcoin and cryptocurrency, IEEE Symposium on security and Privacy, 2015

2. J.A.Garay et al, The bitcoin backbone protocol - analysis and applications EUROCRYPT 2015 LNCS VOl 9057, ( VOLII ), pp 281-310.

3. R.Pass et al, Analysis of Blockchain protocol in Asynchronous networks, EUROCRYPT 2017, ( eprint.iacr.org/2016/454) .

4. R.Pass et al, Fruitchain, a fair blockchain, PODC 2017 ( eprint.iacr.org/2016/916).

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 2 | 2 | 2 | | | | | | | | 2 | 1 |
| **CO2** | 3 | 1 | 1 | 1 | 2 | | | | | | | | 3 | 3 |
| **CO3** | 2 | 2 | **2** | 2 | 2 | | | | | | | | 2 | 2 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

| | L | T | P | C |
|---|---|---|---|---|
| | 3 | 1 | - | 4 |

**20ACS74 SMART CONTRACTS AND SOLIDITY (Minor Degree)**

## Course Outcomes:

After Completion of the course the student will be able to:

1. Understand the basics and objectives of Smart Contracts in a Blockchain.
2. Evaluate the various functionalities and features in an Ethereum to generate Smart Contracts.
3. Understand the Solidity language in creation of a Smart Contracts.
4. Incorporate Smart Contracts in decentralized applications.

## UNIT- I 9 Hrs

**Introduction to Smart Contracts:** Ethereum: Asynchronized Cryptography, Cryptographic hash functions, peer-to-peer network, blockchain, Ethernum virtual machine, Node, Miner, Proof of Work, Decentralized App, Solidity, Smart Contract, GAS, Ehter, Account, Transaction, Preparation: Tool preparation, Testing Environment, Ethereum source code compilation.

## UNIT-II 9Hrs

**Ethereum Virtual Machine (EVM):** Introduction to virtual machines, The role of the Ethereum protocol in banking, Anyone can make a banking platform, What the EVM Does, EVM applications, Understanding state machines, How the Guts of the EVM work, Blocks: The history of state changes.

## UNIT-III 9Hrs

**Solidity Basics:** Solidity Basics, Sol File structure, Structure of contract, variables, operators, statement, Data location, Modifier, Event, Inheritance, Miscellaneous

## UNIT-IV 9Hrs

**Application Binary Interface:** Memory structure, Function selector, Type definition, Data presentation in EVM, Encode, ABI programming. Operation principles of smart contract: Design pattern.

**UNIT-V** **9Hrs**

**Application :** Develop Secure Contract: History, Attacking Vector, Ethernum smart contract: Best practices, Code audit, Decentralized Application: Feature, DApp architecture, Ethernum DApp, IPFS DApp,

## TEXT BOOK:


1. Gavin Zheng, Longxiang Gao, Liqun Huang, Jian Guan, Ethereum Smart Contracts Development in Solidity, 2021, 1st Edition, Springer Singapore.
2. Dannen, C., Introducing Ethereum and solidity, 2017, (Vol. 318). Berkeley: Springer


## REFERENCE BOOKS:


6. Modi, Ritesh, Solidity Programming Essentials: A beginner's guide to build smart contracts for Ethereum and Blockchain, 2018, Packt Publishing Ltd, United Kingdom.
7. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfeder, Bitcoin and cryptocurrency technologies: a comprehensive introduction, 2016, Princeton University Press


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 | 3 |
| C02 | 3 | 2 | 1 | 2 | - | - | - | - | - | - | - | - | 2 | 2 |
| C03 | 3 | 2 | 3 | - | 1 | - | - | - | - | - | - | - | 2 | 2 |
| C04 | 3 | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | 2 | 1 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**(AUTONOMOUS)**
**III B.Tech II Semester CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 4 |

**20ACS75 BLOCKCHAIN PLATFORMS AND USE CASES**
**(Minor Degree)**

**Course Outcomes:** After completion of course, students would be able to:

1. Analyse different types of blockchain platforms.
2. Understand different types of uses of blockchain and apply it to some real-life scenarios accordingly.
3. Acquire knowledge of the shortcomings of blockchain technology and their corresponding solutions.

**UNIT-I: Introduction to Blockchain:** **9hrs**

Various technical definition of Blockchain, Generic Elements of Block chain , Feature of Blockchain, Types of Blockchain: Public blockchains, private block chains semi-private blockchains, sidechains, Permissioned ledger, Distributed ledger, Shared ledger, Fully private and proprietary blockchains.

**Unit-II: Decentralized Application Platforms:** 9**hrs**

Decentralization using blockchain, Methods of decentralization, Route of decentralization Blockchain and full ecosystem decentralization, Decentralized organization, Decentralized applications.

Platforms for decentralization,

**Unit-III: Blockchain Platforms:** 9hrs

Bitcoin, Bitcoin definition, transaction. Blockchain, The bitcoin network, Wallets, wallet types, Non-deterministic wallets, deterministic wallets, hierarchical determistic wallets, Brain wallets, Paper wallets, Hardware wallets, Online wallets, Mobile wallets.

**Unit-IV: Alternative Blockchain**: 9**hrs**

Kadena, Ripple, transaction, Stellar, Rootstock, Quorum; transaction manager, crypto enclave, Quorumchain, Network manager, Tezos: StorJ, Maidsafe, BigchainDB, Tendermint.

**Unit-V: Blockchain Use Cases:** 9**hrs**

Financial Services Related Use Cases, Multinational policy management, Government, Supply Chain Management, Healthcare Related Services: Electronic medical records, Healthcare payment preauthorization,

**Text Books/References:**

1. Tiana Laurence, Blockchain for Dummies, 2nd Edition 2019, John Wiley & Sons.

2. Anshul Kaushik, Block Chain & Crypto Currencies, Khanna Publishing House.

3. Building Blockchain Projects, Narayan Prusty, Packt Publishing.

4. Mastering Blockchain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Blockchain frameworks by Imran Bashir, Packt Publishing (March 17, 2017).

5. Blockchain: Blueprint for a New Economy by Melanie Swan, Shroff Publisher publisher/O'Reilly Publisher Media; 1st edition (2015).

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 3 |
| CO2 | 2 | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | 2 | 2 |
| CO3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | - | 3 | 3 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**
**(AUTONOMOUS)**
**III B.Tech II Semester -CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 4 |

# 20ACS76 BLOCKCHAIN SECURITY AND PERFORMANCE (Minor Degree)

## Course Outcomes:

After Completion of the course the student will be able to:

1. Analyze the security and performance perspective of blockchain technology.
2. Apply security analysis and performance-enhancing techniques related to blockchain.
3. Apply blockchain technology ~~and apply it~~ to provide solutions to some real-life problems.

## UNIT-I 9Hrs

### Security Issues

Blockchain Related Issues, Higher-Level Language (Solidity) Related Issues, EVM Bytecode Related Issues, Real-Life Attacks on Blockchain Applications/ Smart Contracts, Trusted Execution Environments

## Unit-II 9Hrs

### Security Tools for Smart Contracts

Working, Advantages, And Disadvantages of Tools- Oyente, Securify, Maian, Manticore, Mythril, SmartCheck, Verx. Secure Key Management, Quantum Resilience Keys.

## Unit-III 9Hrs

### Performance Related Issues

Transaction Speed, Transaction Fees, Network Size, Complexity, Interoperability Problems, Lack of Standardization. Lack of Supportive Regulations Related to Blockchain Applications.

## Unit-IV 9Hrs

### Performance Improvements

Off-Chain State Channels, Sidechains, Parallels Chains, Concurrent Smart Contract Transactions, Sharding Technique and Its Benefits, Atomic Swaps Between Smart Contracts

## Unit-V 9Hr

## Blockchain Applications

Decentralized Cryptocurrency, Distributed Cloud Storage, EVoting, Insurance Claims, Cross-Border Payments, Asset Management, Smart Appliances.

## Text Books:

1. Mastering Ethereum: Building Smart Contracts and Dapps Book by Andreas Antonopoulos and Gavin Wood, Shroff Publisher/O′Reilly Publisher.

## References Books:

1. Mastering Blockchain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Blockchain frameworks by Imran Bashir, Packt Publishing (March 17, 2017).

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 3 |
| CO2 | 2 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 |
| CO3 | 3 | 2 | 3 | 1 | - | - | - | - | - | - | - | - | 3 | 3 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Semester -CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 4 |

**20ACS77 BLOCKCHAIN AND FINTECH**

**Course Outcomes:**

After Completion of the course the student will be able to:

1. Understand the concepts of Initial Coin Offerings.
2. Analyse Risks associated with DeFi.
3. Use the benefits of blockchain in banking sector.
4. Implement the concepts of decentralized markets

**UNIT –I 12Hrs**

**Cryptocurrencies**

Concept, Cryptocurrency Mining, Uses of Cryptocurrencies, Tokens, Token vs Crypto Coin, Concept of ICOs (Initial Coin Offerings), Benefits of Using ICOs, STOs (Security token offerings), ICO vs STO, Cryptocurrency wallets.

**Unit -II 12Hrs**

**Decentralized Finance (DeFi)**

Concept, Benefits and Risks Associated with DeFi, Centralized vs Decentralized finance, DeFi Projects, DeFi future trends.

**Unit –III 12Hrs**

**Decentralized Markets**

Concept of Decentralized markets, impact of decentralization on financial market, Decentralized Exchanges (DEX), Security, control and privacy concerns related to DEX, Liquidity and Usability of DEX, best DEXs for trading, Fund Management and Trading logic of DEX, Concept of Decentralized Web.

**Unit –IV 12Hrs**

**Blockchain & Cryptocurrency Regulations**

Introduction, History Stance of the Government, Judicial Approach to Cryptocurrency, Possible Reasons for Ban, Virtual Currency Regulations, Global Perspective of Regulations on Blockchain, Future needs for Regulations.

**Unit –V** **12Hrs**

## Blockchain in Banking Sector

Cross-Border Payments Using Blockchain and Its Benefits, Study of blockchain platforms used for cross-border payments, Impact of Blockchain on Banking Services. Stable Coin: Concept, Uses and Types of Stable Coins Case-Study: Tether and Libra Coins

## Text Books


1. Melanie Swan, Blockchain: Blueprint for a new economy, Shroff Publisher/O'Reilly Publisher.
2. Ron Quaranta, Blockchain in Financial Markets and Beyond: Challenges and Applications, Risk Books Publisher.
3. Richard Hayen, Blockchain & FinTech: A Comprehensive Blueprint to Understanding Blockchain & Financial Technology. - Bitcoin, FinTech, Smart Contracts, Cryptocurrency, Risk Books Publisher.


**Corresponding Online Resources:**

1.https://www.accenture.com/in-en/insight-blockchain-technology-how-banks building-real-time

2. https://medium.com/search?q=decentralized%20exchange

3.Emerging Technology Projection: The Total Economic Impact™ Of IBM Blockchain https://www.ibm.com/downloads/cas/QJ4XA0MD

4. https://www.coursera.org/learn/cryptocurrency

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | - | - | 1 | - | - | - | - | - | - | - | 2 | 3 |
| CO2 | 3 | 3 | - | - | 1 | - | - | - | - | 2 | - | - | 2 | 3 |
| CO3 | 3 | 3 | 3 | - | - | 1 | - | - | - | - | - | - | 2 | 1 |
| CO4 | | | | | 1 | | | | 1 | | | | 1 | |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY [AUTONOMOUS]

**III B. TECH I-SEMESTER CSE [DS], (Professional Elective Courses-I)**
**II B. TECH II-SEMESTER CSE (Minor in Data science)**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

## 20ACD05 DATA ANALYTICS

**COURSE OUTCOMES**

After Completion of the course the student will be able to:

1. Explain the fundamentals of Data Analytic processes and tools
2. Describe the phases of Data Analytic Lifecycle and its influence over Business Models.
3. Apply different Data Analytics techniques for Classification and Clustering problems.
4. Analyze data stream model and architecture to design and build Real Time Analytical applications.

**UNIT 1 DATA ANALYTICS INTRODUCTION 10**

Introduction – Challenges of conventional systems –Data Definitions - Web data – Organization/sources of data - Importance of data quality- Dealing with missing or incomplete data-Data Classification. Evolution of Analytic scalability, Analytic processes and tools, Analysis vs reporting - Modern data analytic tools, Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis vs Reporting.

**UNIT 2 DATA ANALYTICS LIFE CYCLE 9**

Data Analytics Lifecycle -Need of Data analytic lifecycle - Key roles for successful analytic projects - various phases of Data analytic lifecycle: Discovery - Data Preparation - Model Planning - Model Building -Communicating Results - Operationalization. Statistical concepts: Sampling distributions, resampling, statistical inference, prediction error - Business drivers for analytics - Typical analytical architecture.

**UNIT 3 DATA ANALYTICS TECHNIQUES 9**

Theory & Methods: Cluster Analysis- Association Rules – Apriori algorithm -Regression Analysis-Dispersion Analysis- Discriminant Analysis-Multivariate Analysis - Bayesian modeling inference and Bayesian networks - Naïve Bayesian classifiers- Decision Trees- Support vector and kernel methods.

**UNIT 4 ADVANCED ANALYTICS 8**

Analysis of time series: linear systems analysis, nonlinear dynamics - Rule induction - Neural networks: learning and generalization, competitive learning, principal component analysis and neural networks; Fuzzy logic: extracting fuzzy models from data, fuzzy decision trees, Stochastic search methods.

**UNIT 5 STREAMING ANALYTICS 9**

Introduction to Streams Concepts – Stream data model and architecture - Stream Computing, Sampling data in a stream – Filtering streams – Counting distinct elements in a stream – Estimating moments – Counting oneness in a window – Decaying window - Realtime Analytics Platform (RTAP) applications - case studies - real time sentiment analysis, stock market predictions.

**TOTAL=45Hrs.**

**TEXT BOOK**


1. Michael Berthold, David J. Hand, Intelligent Data Analysis, Springer, 2007.
2. Trevor Hastie - Robert Tibshirani - Jerome Friedman - "The Elements of Statistical Learning", Springer,2011.


**REFERENCE**


1. Anand Rajaraman and Jeffrey David Ullman, Mining of Massive Datasets, Cambridge University Press, 2012.
2. Andrew G.Psaltis,” Streaming DATA: Understanding the real-time pipeline”, Manning Publications,2017.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | | | | | | | | | | 3 | 3 |
| CO2 | 3 | 3 | 2 | | | | | | | | | | 2 | 3 |
| CO3 | 3 | 3 | 2 | | | | | | | | | | 2 | 3 |
| CO4 | 3 | 2 | 2 | | | | | | | | | | 3 | 3 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**III B. TECH I-SEMESTER (CSE [DS], CSE (AI & ML) (Job Oriented Elective Courses-I)**
**III B. TECH I-SEMESTER CSE (Minor in Data Science)**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

**20ACD09 DISTRIBUTED DATABASE AND INFORMATION SYSTEMS**

**COURSE OUTCOMES:**

After Completion of the course the student will be able to:

- Describe the concepts of distributed relational database and query processing.
- Summarize distributed security techniques and database recovery.
- Apply the appropriate protocols for symmetric and asymmetric cryptosystems.
- Analyze the functions and components of Information system.
- Analyze the decision support system and tools for Business operations.

**UNIT 1 INTRODUCTORY 9 Hrs.**
Data Fragmentation - Replication and allocation techniques for DDBMS - Methods for designing and implementing DDBMS - designing a distributed relational database - Architectures for DDBMS - Cluster federated - parallel databases and client server architecture - Overview of query processing.

**UNIT 2 DISTRIBUTED SECURITY 9 Hrs.**
Overview of security techniques - Cryptographic algorithms - Digital signatures – Distributed Concurrency Control – Serializability theory - Taxonomy of concurrency control mechanisms - Distributed deadlocks – Distributed Database Recovery - Distributed Data Security - Web data management - Database Interoperability.

**UNIT 3 ADVANCES IN DISTRIBUTED SYSTEMS 9Hrs**
Authentication in distributed systems - Protocols based on symmetric cryptosystems - Protocols based on asymmetric cryptosystems - Password-based authentication - Unstructured overlays – Chord distributed hash table - Content addressable networks (CAN) - Tapestry - Some other challenges in P2P system design - Tradeoffs between table storage and route lengths - Graph structures of complex networks - Internet graphs - Generalized random graph networks.

**UNIT 4 FUNDAMENTALAS OF INFORMATION SYSTEMS 9 Hrs.**
Defining information – Classification of information – Presentation of information systems – Basics of Information systems – Functions of information systems – Components of Information systems- Limitations of Information systems – Information System Design.

**UNIT 5 ENTERPRISE COLLOBRATION SYSTEMS 9 Hrs.**
Groupware – Types of groupware – Enterprise Communication tools – Enterprise Conferencing tools – Collaborative work management tools – Information System for Business operations – transaction processing systems – functional Information Systems – Decision Support systems – Executive Information systems – Online Analytical processing.

**TOTAL=45Hrs**

**TEXT BOOKS**

1. George Coulouris, Jean Dollimore, Tim Kindberg, “Distributed Systems Concepts and Design”, Fifth Edition, Pearson Education Asia, 2012.
2. Ajay D. Kshemkalyani, MukeshSinghal, "Distributed Computing: Principles, Algorithms, and Systems", Cambridge University Press, 2008.

**REFERENCE BOOKS**

1. Distributed Databases - Principles and Systems; Stefano Ceri; Guiseppe Pelagatti; Tata McGraw Hill; 2006.
2. Ralph Stair and George Reynolds. , “Principles of Information Systems” Course Technology, Inc.,2006.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 3 |
| CO2 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| CO3 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| CO4 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| CO5 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | 2 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**III B. TECH II-SEMESTER CSE(DS)-PE-II**

**III B. TECH II-SEMESTER CSE (Minor in Data science)**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

## 20ACD16 - DATA CENTRE AND NETWORKING TECHNOLOGIES

**Course Outcome:**

After Completion of the course the student will be able to:

- Explain the Fundamentals of Data Centre Design and Requirements of modern data repositories.
- Analyze the Network Connectivity and optimization standards for establishing Data Centre and Server Architectures.
- Analyze the concepts of clustering, scaling, optimization and virtualization of server architecture.
- Apply the techniques of Layer 2 Networks and Layer 3 Networks features and standards for Data Centre Application services.

**UNIT I - EVOLUTION OF DATA CENTRE DESIGN 9hrs**

Design for flexibility, scalability, environmental control, electrical power, flooring, fire protection, security, network infrastructure. Energy use and greenhouse gas emissions. Requirements for modern data centres, high availability and Service Orientated Infrastructures (SOI). Modern data centre use case studies.

**UNIT II - DATA CENTRE ARCHITECTURES 9hrs**

Network connectivity optimization evolution: Top of rack (TOR), end of rack (EOR), scale up vs scale up, solutions that reduce power and cabling. Data Centre standards; TIA/EIA-942. Structured cabling standards, fibre and copper cabling characteristics, cable management, bandwidth requirements, I/O connectivity.

**UNIT III - SERVER ARCHITECTURES** **9hrs**

Stand-alone, blades, stateless, clustering, scaling, optimization, virtualization. Limitation of traditional server deployments; modern solutions. Applications; database, finance etc. Redundant Layer 2 and Layer 3 designs. Case studies.

**UNIT IV - LAYER 2 NETWORKS** **9hrs**

Ethernet; IEEE 802.3ba; 40 Gbps and 100 Gbps Ethernet. IEEE 802.1D Spanning Tree Protocol (STP), RSTP, PVST, MSTP. TRILL (Transparent Interconnection of Lots of Links), RBridges, IEEE 802.1Qbg Edge Virtual Bridging, 802.1Qbh Bridge Port Extension. Fibre Channel over Ethernet (FCoE) vs Internet Small Computer System Interface (iSCSI). Data Center Bridging (DCB); priority-based flow control, congestion notification, enhanced transmission selection, Data Center Bridging Exchange (DCBX). Layer 2 Multicasting; Case studies.

**UNIT V - LAYER 3 AND BEYOND** **9hrs**

Layer 3 Data Centre technologies, network virtualization. Protocols; IPv4, IPv6, MPLS, OSPF, IS-IS, BGP. OTV, VPLS layer 2 extension protocols. Locator Identifier Separation Protocol (LISP). Layer 3 Multicasting. Data centre application services. Data centre networking use case studies and the enabling technologies and protocols in the modern data centre.

**TOTAL=45Hrs**

**TEXT BOOKS**


1. SilvanoGai, Claudio DeSanti,“I/O Consolidation in the Data Center” Cisco Press; 1st edition [ISBN: 9781587058882]. 2009.
2. Kevin Corbin, Ron Fuller, David Jansen, “NX-OS and Cisco Nexus Switching: Next-Generation Data Center Architectures” Cisco Press; 1 edition [ISBN: 9781587058929], 2010.
3. SilvanoGai, TommiSalli, Roger Andersson, “Cisco Unified Computing System”, Cisco Press; 1st edition, [ISBN: 9781587141935], 2010.


**REFERENCES**


1. Nash Darukhanawalla, Patrice Bellagamba, “Interconnecting Data Centers Using, VPLS” Cisco Press; 1 edition, [ISBN: 9781587059926], 2009.
2. Robert W. Kembel, Roger Cummings (Introduction), “The Fibre Channel, Consultant” Northwest Learning Assoc; 3rd Edition, [ISBN: 0931836840], 1998.
3. Robert W Kembal“Fiber Channel Switched Fabric” Northwest Learning, Associates, inc. [ISBN: 0931836719], 2009.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 | 3 |
| C02 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| C03 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| C04 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 | 2 |

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B. TECH II-SEMESTER CSE[DS]**
**III B. TECH II-SEMESTER (CSE -Minor in Data Science)**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

## 20ACD18 INTRODUCTION TO MACHINE LEARNING: SUPERVISED LEARNING
**(Open Elective/ Job Oriented Elective -II)**

### COURSE OUTCOMES

After Completion of the course the student will be able to:

- Apply principles of Data Science to the analysis of business problems.
- Use data mining software to solve real-world problems.
- Apply algorithms to build machine intelligence.
- Analyze the machine learning algorithm to perform various data analysis.

### UNIT I INTRODUCTION TO MACHINE LEARNING, LINEAR REGRESSION 9

Introduction-Simple Linear Regression-Least Squared Method- Model Fitness and R-squared - Coefficient Significance and Test Error

### UNIT II MULTILINEAR REGRESSION 8

Linear Regression with Higher-Order Terms: Polynomial Regression-Bias-Variance Trade-Off Linear Regression with Multiple Features-Feature Selection, Correlation, and Interaction.

### UNIT III LOGISTIC REGRESSION 8

Logistic Regression Introduction-Logistic Regression Optimization-Performance Metrics in Classification-Sklearn Library Usage and Examples.

### UNIT IV NON-PARAMETRIC MODELS 8

Intro to Non-parametric and K-nearest Neighbors-Decision Tree Intro, Decision Tree Regressor Decision Tree Classifier, Metrics (Gini and Entropy)-Sklearn Usage, DT Hyperparameters and Early Stopping -Minimal Cost-complexity Pruning

### UNIT V ENSEMBLE METHODS AND SUPPORT VECTOR MACHINE 12

Ensemble Method Intro: Random Forest-Boosting Introduction -AdaBoost Algorithm-Gradient Boosting-Support Vector Machine Introduction-Support Vector Machine: Soft Margin Classifier-Support Vector Machine: Kernel Trick-Support Vector Machine: Performance

### TEXT /REFERENCE BOOKS


1. Introduction to Machine Learning with Python: A Guide for Data Scientists, by Andreas Muller
2. Zhi-Hua Zhou, “Ensemble Methods: Foundations and Algorithms”, CRC Press, 2012


### REFERENCES


1. Monte F. Hancock, Jr. Practical Data Mining. 1st edition. Auerbach Publications, 2011.
2. Jain, V. K. Machine Learning. First edition. Khanna Book Publishing Company, 2019.


### WEB REFERENCES


1. https://machinelearningmastery.com/stacking-ensemble-machine-learning-with-python/
2. https://www.coursera.org/learn/introduction-to-machine-learning-supervised-learning

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | | | | | | | | | 3 | 3 |
| CO2 | 3 | 2 | 3 | | | | | | | | | 3 | 2 |
| CO3 | 3 | 3 | 3 | | | | | | | | | 3 | 2 |
| CO4 | 3 | 2 | 3 | | | | | | | | | 3 | 3 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B. TECH I-SEMESTER CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

**20ACD31 - TEXT ANALYTICS**

**COURSE OUTCOMES**:

After the completion of this course, students will be able to:

- Explain the methods for keyword extraction from documents.
- Identify different clustering techniques for grouping of textual documents.
- Apply classification algorithms for documents classification and detecting spams in email.
- Analyze the Feature extraction and event operations in Text streaming.

**UNIT I TEXT EXTRACTION 9**

Introduction- Rapid automatic keyword extraction: candidate keywords, keyword scores, adjoining keywords, extracted keywords-Benchmark evaluation: precision and recall, efficiency, stoplist generation, Evaluation on new articles.

**UNIT II DOCUMENT CLUSTERING 9**

Multilingual document clustering: Multilingual LSA, Tucker1 method, PARAFAC2 method, LSA with term alignments, LMSA, LMSA with term alignments; Constrained clustering with k-means type algorithms.

**UNIT III CONTENT BASED CLASSIFICATION 9**

Classification algorithms- Document Classification, Content-based spam email classification, Utilizing nonnegative matrix factorization for email classification problems.

**UNIT IV ANOMALY AND TREND DETECTION 9**

Text visualization techniques: Visualization in text analysis, Tag clouds, tag clouds, authorship and change tracking, Data Exploration and the search for noval patterns, sentiment tracking, visual analytics and Future Lens, scenario discovery. Adaptive threshold setting for novelty mining: Introduction, adaptive threshold for anomaly detection, Experimental study.

**UNIT V EVENTS AND TRENDS IN TEXT STREAMS 9**

Introduction, Text streams, Feature extraction and data reduction, Event detection, Trend detection, Event and trend descriptions. Embedding semantics in LDA topic models: Introduction, vector space modeling, latent semantic analysis, probabilistic latent semantic analysis, Latent Dirichlet allocation, embedding external semantics from Wikipedia, data-driven semantic embedding.

**TOTAL=45Hrs**

**TEXT BOOKS:**


1. Michael W. Berry & Jacob Kogan,"Text Mining Applications and Theory", Wiley publications, 2010.
2. Aggarwal, Charu C., and ChengXiangZhai, eds., “Mining text data”, Springer Science & Business Media, 2012.


**REFERENCES**


1. Miner, Gary, et al., “Practical text mining and statistical analysis for non-structured text data applications”, Academic Press, 2012.
2. Srivastava, Ashok N., and MehranSahami, “Text mining: Classification, clustering, and applications”, Chapman and Hall/CRC, 2009.
3. Buitelaar, Paul, Philipp Cimiano, and Bernardo Magnini, eds., “Ontology learning from text: methods, evaluation and applications”, Vol. 123. IOS press, 2005.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 1 | | | | | | | | | 3 | 2 |
| CO2 | 3 | 2 | 1 | | | | | | | | | 3 | 2 |
| CO3 | 3 | 3 | 2 | | | | | | | | | 2 | 3 |
| CO4 | 3 | 3 | 2 | | | | | | | | | 2 | 2 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**II B.Tech II Semester-CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 4 |

**20ACS78 HTML & CSS**

**Course Outcomes:**

After Completion of the course the student will be able to

1. Analyze and apply the role of languages HTML, DHTML, database access in the working of the web and web applications.
2. Use internal and external cascading style sheets (CSS) to consistently format elements on a page or group of pages.
3. Ability to work with links exploring the URL and ability creating Hyperlinks, linking to mail system.
4. Create a table, adding title to a column, working with images, colors and canvas

Build dynamic web pages using HTML and CSS

**UNIT-I** **8 hrs**

**INTRODUCTION**

Internet and Web, HTML, Javascript, CSS,XML,XHTML, Ajax,Php,HTML5 and its Elements, HTML5-Next generation web development, Structuring an HTML Document, creating and saving an HTML Documents, Validating an HTML Documents, Viewing an HTML Documents.

**UNIT II** **9 hrs**

Understanding Elements, Describing Data Types, working with root and metadata elements, working with script and no script elements, working with section elements, working with header and footer elements, working with Headings , working with charter entities, Horizontal rules, line breaks, paragraphs ,working with Text: formatting Text with HTML Documents, Mark elements, strong elements, code, small elements.

**UNIT III** **8 hrs**

Displaying Plain text, bold text, Italic text, small text, subscripted text, Inserted text, Deleted text, variables and arguments using VAR elements, Organizing Text in HTML: arranging Text, Displaying List, Working with links: Exploring the Hyperlinks, Exploring the URL, Exploring the newsgroup and mail system, Link relation, creating Hyperlinks, linking to mail system.

**UNIT IV** **8 hrs**

Creating tables : Understand tables, Describing the Table Elements, creating simple table, adding title to a column, adding caption to a table, specifying properties of the column, spanning rows and columns, working with images, colors and canvas : inserting images in a web pages, Exploring colors .

## UNIT V **7 hrs**

Evolution of CSS, syntax of CSS, Exploring CSS sectors, inserting CSS sectors in HTML Doc, Exploring background of webpage, Exploring color properties ,understanding fonts, exploring font properties, web fonts.

## Text Books:

1.DT Editorial Service ," HTML 5 Black Book, Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and jQuery, 2ed 2016 , Dream Tech Press .

## Reference books:

1. M. Deitel, P.J. Deitel, A. B. Goldberg ,Internet& World Wide Web How to H program, 3 rd Edition, Pearson Education, 2004.

2. Ellie Quigley, Marko Gargenta,"PHP and MySQL" , Prentice Hall(Pearson),2006

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | 1 | - | - | 2 | - | - | - | 1 | 3 | 2 |
| CO2 | 2 | 2 | - | - | 2 | - | - | 2 | - | - | - | 2 | 1 | 3 |
| CO3 | 2 | 1 | - | 1 | 2 | - | - | 2 | - | - | - | 2 | 1 | 2 |
| CO4 | 2 | - | - | 1 | 2 | - | - | 2 | - | - | - | 1 | 2 | 3 |

## ENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.Tech I Semester CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 4 |

**20ACS79 WEB APPLICATION DEVELOPMENT WITH PHP**

## Course Outcomes:

After Completion of the course the student will be able to:

1. Develop simple program using control statement.
2. Perform operations based on arrays and strings.
3. Develop programs by applying object oriented concepts.
4. Design Web pages using form controls.
5. Perform database operations using MYSQL and PHP.

## UNIT- I 12 Hrs

**Introduction to PHP:** Lexical Structure, Variables, Data types, Expressions and operators, Flow Control Statements, Embedding PHP in Web Pages.

**Functions:** Calling a Function, Defining a Function, Variable Scope, Function Parameters, Return Values, variable functions, Anonymous Functions.

## UNIT-II 12 Hrs

**Arrays:** Indexed Versus Associative Arrays, Identifying Elements of an Array, Storing Data in Arrays, Extracting Multiple Values, Multidimensional Arrays, Converting Between Arrays and Variables, Traversing Arrays, Sorting, Acting on Entire Arrays, Using Arrays-Sets, Stacks , Iterator Interface.

**Strings:** Quoting String Constants, Printing Strings, Accessing Individual Characters, Cleaning Strings, Encoding and Escaping, Comparing Strings, Manipulating and Searching Strings, Regular Expressions.

## UNIT-III 12 Hrs

**Objects:** Creating an Object, Accessing Properties and Methods, Declaring a Class, Introspection, Serialization.

**Graphics:** Embedding an Image in a Page, Basic Graphics Concepts, Creating and Drawing Images, Images with Text, Dynamically Generated Buttons, Scaling Images, Color Handling.

**PDF :** Initializing the Document, Outputting Basic Text Cells, Text Coordinates, Text Attributes, Page Headers, Footers, and Class Extension, Images and Links, Tables and Data.

## UNIT-IV 12 Hrs

**Web Techniques:** HTTP Basics, Variables, Server Information, Processing Forms, Form Validation,

Setting Response Headers, Combining Cookies and Sessions, SSL.

**XML:** Lightning Guide to XML , Generating XML, Parsing XML , Parsing XML with DOM , Parsing XML with SimpleXML, Transforming XML with XSLT.

**Security:** Filter Input, Cross-Site Scripting- SQL Injection, Escape Output-Filenames, Session Fixation, File Uploads, File Access.

## UNIT-V 12 Hrs

**Databases :** Using PHP to Access a Database, Relational Databases and SQL, PHP Data Objects, MySQLi Object Interface, Retrieving Data for Display, SQLite, Direct File-Level Manipulation, MongoDB, Retrieving Data, Inserting More Complex Data.

**Web Services :** REST Clients, Responses, Retrieving Resources, Updating Resources, Creating Resources, Deleting Resources, XML-RPC:- Servers, Clients.

## TEXT BOOK:

2. Programming PHP, Rasmus Lerdorf, Kevin.T and Peter M., 2013, 3rd Edition, O'Reilly, USA.

## REFERENCE BOOKS:

1. Luke Welling, Laura Thomson, "PHP and MySQL Web Development", 5th Edition, Pearson Education, 2016. ISBN: 978-9332582736.
2. PHP and MySQL, PHP and MySQL in easy steps, 2nd edition, 2017, ISBN: 9789386551405.
3. The Complete Reference PHP, Holzner, Steven, Indian Edition 2017.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | - | - | - | - | - | - | - | - | - | - | - | 3 | - |
| C02 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| C03 | 3 | 3 | - | 2 | 2 | - | - | - | - | - | - | - | 2 | - |
| C04 | 3 | - | 2 | - | - | - | - | - | 2 | 3 | 3 | 2 | 2 | - |
| C05 | 3 | - | 1 | 2 | 3 | - | - | - | - | - | 3 | - | - | 1 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.Tech II Semester CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 4 |

**20ACS80** **DJANGO FRAMEWORK**

### Course Outcomes:

After completion of the course the student will able to do

1. Understand the basics of Django and dynamic web pages.
2. Understand the concepts of how to interact with databases with administration site.
3. Understand the fundamentals of Views URLs and Templates.
4. Understand the Non-HTML content with sessions, users and registration.
5. Understand the fundamentals of caching and middleware.

### UNIT I - Introduction to Django 9

What is web framework – The MVC design pattern – Django's history – Getting started with

Django – Setting up a database – Staring a project – The basics of dynamic webpages - Mapping URL to views – How Django processes a request – URLconfs and loose coupling – 404 Errors – Dynamic URLs – Django's pretty error pages – The Django template system.

### UNIT II - Interacting with Databases, Django Administration Site and Form Processing 9

The Dumb way to do database queries in views – The MTV development pattern – Configuring the databases – Defining models in python – First model – Installing the model – Basic data access – Adding model string representation – Inserting and updating data – Selecting objects – Deleting objects – Making changes to database schema – The Django administration site – Activating the admin interface – Using the admin interface – Customizing the admin interface – Customizing the admin index page – Form processing – Search – The perfect form – creating a feedback form – processing the submission – custom validation rules – Creating forms from models

### UNIT III – Advanced Views and URLconfs, Generic Views and Extending the Template Engine 9

URLconf tricks – Including other URLconfs – Generic Views – Using generic views – Generic view of objects – Extending generic views – Extending the Template Engine – Template language review – RequestContext and Context Processors – Inside template loading – Extending the template system – Writing custom template loaders – Using the built-in template reference – Configuring the template system in standalone mode.

## UNIT IV – Generating Non-HTML Content, Sessions, Users and Registration

**9**

Generating Non-HTML Content – Producing CSV – Generating PDFs – Other possibilities – The syndication feed framework – The sitemap framework – Sessions, Users and Registration – Cookies – Django's session framework – Users and authentication – Permissions, Groups, Messages and Profiles

## UNIT V – Caching, Other Contributed Sub frameworks and Middleware

**9**

Caching – Setting up the cache – The Per-Site cache – The Per-View cache – The low level cache API – Upstream caches – The Django's standard library – Sites – Flat pages – Redirects - CSRF protection – Humanizing data – Markup filters – Middleware – What is middleware – Middleware installation – Middleware methods – Built-in middleware.

**TOTAL: 45 PERIODS**

## TEXT BOOK:

3. Adrian Holovaty, Jacob K. Moss, "Django The Definitive Guide to Django: Web Development Done ", www.djangobook.com

## REFERENCE BOOKS:

4. Daniel Rubio, "Beginning Django Application Development and Deployment with Python", Apress.
5. Beau Curtin, "Django Cookbook Web Development with Django Step by Step Guide", 2$^{nd}$ Edition Mapping:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | 1 | - | - | 2 | - | - | - | 1 | 1 | 3 |
| CO2 | 2 | - | - | - | 2 | - | - | 2 | - | - | - | 1 | 1 | 2 |
| CO3 | 2 | - | - | 1 | 2 | - | - | 2 | - | - | - | 1 | 2 | 1 |
| CO4 | 2 | - | - | 1 | 2 | - | - | 2 | - | - | - | 1 | 1 | 1 |
| CO5 | 2 | - | - | 1 | 1 | - | - | 1 | - | - | - | 1 | 3 | 3 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**III B.Tech II Semester CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 4 |

**20ACS81** **FULL STACK REACT**

## Course Outcomes:

After Completion of the course the student will be able to:

1. Develop industry-ready Single Page Web Application and APIs using React.
2. Create a full E-Commerce App with React.
3. Apply intermediate and advanced web development practices.
4. Comprehensive knowledge about technologies.

## UNIT- I 12 Hrs

**First React Web Application:** Prepare the app, Building Product, Rendering multiple products, Propagating the event, Binding custom component methods, Updating state and immutability, Babel plugins and presets, Refactoring ProductList.

**Components:** Breaking the app into components, Build a static version of the app, Determine what should be stateful, Determine in which component each piece of state should live, Hard-code initial states, Add inverse data flow.

## UNIT-II 12 Hrs

**Components & Servers:** The Server API, Playing with the API.

**JSX and the Virtual DOM:** React Uses a Virtual DOM, ReactElement, JSX.

**Advanced Component Configuration with props, state, and children:** ReactComponent, PropTypes, context, Stateful components, Stateless components, talking to Children Components with props.children.

## UNIT-III 12 Hrs

**Forms:** Form Modules, Webpack basics, Using Create React App with an API server

Using Webpack with Create React App: JavaScript modules, Exploring Create React App,

**Unit Testing:** Using Jest, Testing strategies for React applications, Testing a basic React component with Enzyme, Writing tests for the food lookup app.

**Routing:** Building the components of react-router, Dynamic routing with React Router, Supporting authenticated routes.

**UNIT-IV** **12 Hrs**

**Intro to Flux and Redux:** Flux implementations, Redux, Building a counter, Building the store, Building the reducer(), Subscribing to the store , Connecting Redux to React.

**Intermediate Redux:** Using createStore() from the redux library, Representing messages as objects in state, Introducing threads, Breaking up the reducer function.

**UNIT-V** **12 Hrs**

**Using Presentational and Container Components with Redux:** Presentational and container components, generating containers with react-redux, Action creators.

**Using GraphQL:** GraphQL Benefits, Complex Types, Exploring a Graph.

## TEXT BOOK:

3. Fullstack React: The Complete Guide to ReactJS and Friends, Ari Lerner, Anthony Accomazzo, Nate Murray, Clay Allsopp, 2017.

## REFERENCE BOOKS:


1. Mastering Full-Stack React Web Development, Tomasz Dyl, Kamil Przeorski, Maciej Czarnecki, Packt Publishing Ltd, ISBN: 978-9332582736, 2017.
2. Learning React: Functional Web Development with React and Redux, 1st Edition, Alex Banks, Eve Porcello, 2017, O'Reilly, USA.
3. The Road to React, Robin Wieruch: Publisher: Robin Wieruch, 2017: ISBN: 172004399X, 9781720043997.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | - | 2 | 2 | 3 | - | - | - | 3 | - | - | 3 | - | - |
| C02 | 3 | - | 3 | 2 | 3 | - | - | - | 3 | - | - | - | - | 1 |
| C03 | 3 | 3 | 2 | 2 | - | - | - | - | - | 3 | - | - | - | - |
| C04 | 3 | 2 | 2 | 2 | - | - | - | - | 2 | 3 | - | 2 | 2 | - |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Semester CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 4 |

**20ACS82** **FULL STACK DEVELOPMENT USING Node.js, Type script**

## Course Outcomes:

After completion of the course the student will able to do

1. Understand the basics Node.js and getting started with Node.js
2. Understand the concepts of asvnc.js and callback features
3. Understand the fundamentals of Typescript
4. Understand the how the typescript runs in a browser and on a server.

### UNIT I – Getting Started with Node.js 9

Hello world HTTP server – Hello world command line – Installing and running Node.js – Running a Node program – Hello world with express – Hello world basic routing – How to create key and certificate – TLS socket server – TLS socket client – Arduino communication with Node.Js

### UNIT II - async.js 9

Syntax – Call async.parallel() with an object – Resolving multiple values - Call async.series() with an object – Async/Await – Introduction – Examples – Asynchronous programming – Introduction – Syntax – Callback function in JavaScript – Callback functions in Node.js – Try catch – Working possibilities.

### UNIT III – Advanced Concepts in Node.js 9

Auto reload on changes – Avoid call back hell – Bluebird promises – Callback to promise – Cassandra Integration – CLI – Client server communication – Cluster module – Connect to Mongodb

### UNIT IV – Typescript Language Features 9

Javas script is valid Typescript – Types – Operators – Functions – Interfaces – Classes – Generics – Code organization – The type system.

### UNIT V – Advanced Concepts in Typescript 9

Object orientation in Typescript – Understanding the runtime – Running Typescript in a browser – Running Typescript on server – Exceptions, Memory and Performance – Using java script libraries – Automated testing.

**TOTAL: 45 PERIODS**

**TEXT BOOKS:**

4. Free Ebook, “Learning Node.js”, #node.js
5. Steve Fenton " Pro TypeScript Application-Scale JavaScript Development", Second Edition, Apress.

**REFERENCE BOOK:**

6. Krishna Rungta, “Learn NodeJS in 1 Day”

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | 1 | - | - | 2 | - | - | - | 1 | 1 | 2 |
| CO2 | 2 | - | - | - | 2 | - | - | 2 | - | - | - | 2 | 2 | 3 |
| CO3 | 2 | - | - | 1 | 1 | - | - | 1 | - | - | - | 1 | 1 | 1 |
| CO4 | 2 | - | - | 1 | 2 | - | - | 2 | - | - | - | 1 | 3 | 2 |

**B.Tech CSE – Minors(Cyber Security)**

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**II B.Tech II Semester-CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 4 |

## 20ACS83 INFORMATION THEORY FOR CYBER SECURITY

### Course Outcomes:

After Completion of the course the student will be able to

1. Introduce the principles and applications of information theory.
2. Justify how information is measured in terms of probability and entropy.
3. Learn coding schemes, including error correcting codes.

### UNIT I **7 hrs**

Shannon's foundation of Information theory, Random variables, Probability distribution factors, Uncertainty/entropy information measures, Leakage, Quantifying Leakage and Partitions, Lower bounds on key size: secrecy, authentication and secret sharing. Provable security, computationally-secure, symmetric cipher.

### UNIT II **7 hrs**

Secrecy, Authentication, Secret sharing, Optimistic results on perfect secrecy, Secret key agreement, Unconditional Security, Quantum Cryptography, Randomized Ciphers, Types of codes: block codes, Hamming and Lee metrics, description of linear block codes, parity check Codes, cyclic code, Masking techniques.

### UNIT III **8 hrs**

Information-theoretic security and cryptograph, basic introduction to Diffie-Hellman, AES, and side-channel attacks.

### UNIT IV **7 hrs**

Secrecy metrics: strong, weak, semantic security, partial secrecy, Secure source coding: rate-distortion theory for secrecy systems, side information at receivers, Differential privacy, Distributed channel synthesis.

### UNIT V **7 hrs**

Digital and network forensics, Public Key Infrastructure, Light weight cryptography, Elliptic Curve Cryptography and applications.

### Text Books/References:

1. Information Theory and Coding, Muralidhar Kulkarni, K S Shivaprakasha, John Wiley & Sons.
2. Communication Systems: Analog and digital, Singh and Sapre, Tata McGraw Hill.
3. Fundamentals in information theory and coding, Monica Borda, Springer.
4. Information Theory, Coding and Cryptography R Bose.
5. Information Security & Cyber Laws, Gupta & Gupta, Khanna Publishing House.
6. Multi-media System Design, Prabhat K Andleigh and Kiran Thakrar.

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | **3** | **2** | **1** | **2** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **3** | **2** |
| **CO2** | **3** | **3** | **3** | **3** | **1** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **3** | **2** |
| **CO3** | **3** | **3** | **2** | **3** | **2** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **3** | **2** |

**Minor Degree in Cyber Security**

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.Tech I Semester CSE**

| | | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 1 | - | 4 |
| **20ACS84** | **STEGANOGRAPHY AND DIGITAL WATERMARKING** | | | | |

**COURSE OUTCOMES**

After Completion of the course the student will be able to:

1. Describe the basics of watermarking techniques and importance of Steganography.
2. Understand different types of watermarking applications and frameworks.
3. Analyze the models of watermarking
4. Discuss the concepts of steganography
5. Build self-learning and skills to deal with Steganalysis

**UNIT I INTRODUCTION (10)**

Introduction to Information Hiding- Steganographic technique- Substitution Systems and Bitplane Tools - Transform Domain Technique - Spread Spectrum and Information Hiding - Statistical Steganography - - Distortion Techniques-Cover Generation Technique - Principles of Steganography- Frameworks for Secret Communication, Security of Steganography Systems, Information Hiding in Noisy Data, Adaptive Versus Nonadaptive Algorithms- Active and Malicious Attackers- Information Hiding in Written Text.

Unit 2 – **Introduction to Watermarking Techniques (10)**

Basic Watermarking Principles - Watermarking Applications - Requirements and Algorithmic Design Issues - Evaluation and Benchmarking of Watermarking Systems - A Survey of Current Watermarking Techniques - The Choice of Host Locations in the Cover: Cryptographic and Psycho visual Aspects - The Choice of Workspace - Formatting the Watermark Bits - Merging the Watermark and the Cover - Optimization of the Watermark Receiver Extensions from Still Images to Video

**UNIT III Digital Watermarking (10)**

Digital Watermarking- Digital Steganography- Differences between Watermarking and Steganography- Classification in Digital Watermarking- Classification Based on Characteristics- Classification Based on Applications-- Digital Watermarking Fundamentals- Spatial-Domain

Watermarking, Frequency-Domain Watermarking- The Fragile Watermark-The Block-Based - Robust watermarks. - Watermarking Attacks- Image Processing Attacks, Geometric Transformation. Cryptographic Attack, Protocol Attacks, Watermarking Tools.

**UNIT IV Introduction to Digital Steganography ( 12)**

Types of Steganography- Applications of Steganography- Embedding Security and Imperceptibility- Examples of Steganographic Software- Steganalysis-Introduction and Terminology - Looking for Signatures-Detecting Hidden Information Extracting Hidden Information - Disabling Hidden Information- The Statistical Properties of Images- The Visual Steganalytic System- IQM-Based Steganalytic System- Learning Strategies- The Frequency-Domain Steganalytic System.

**UNIT V - Robustness of Copyright Marking Systems** (10)

Robustness of Copyright Marking Systems -Robustness Requirements -Signal Diminishment-Watermark Detector Failure-Counterfeiting Marks- Detection of the Watermark- System Architecture Issues- Court of Law Attacks.

Copyright on the Internet and Watermarking- Digital Copyright and Watermarking- Conflict of Copyright Laws on the Internet.

**Text Books**

1. Stefan Katzenbeisser, Fabien, A.P. Petitcolas., "Information Hiding Techniques for Steganography and Digital Watermarking", Artech House.
2. Frank Y. Shih., "Digital Watermarking and Steganography: Fundamentals and Techniques", CRC Press.(2nd edition)

**Reference Books**

1.Neil F. Johnson; Zoran Duric; Sushil Jajodia, "Information Hiding: Steganography and Watermarking - Attacks and Countermeasures", Springer.

2.Gregory Kipper, "Investigator's Guide to Steganography", Auerbach Publications.

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| CO2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 2 | 2 |
| CO3 | 3 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | 2 | 2 |
| CO4 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| CO5 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 3 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**III B.Tech II Semester CSE**

| | L | T | P | C |
|---|---|---|---|---|
| | 3 | 1 | - | 4 |

**20ACS85 SECURITY POLICY AND GOVERNANCE**

**COURSE OUTCOMES**:

After Completion of the course the student will be able to:

1. Understand the basic concepts of Policy Development and Guidelines.
2. To Learn about the Information classification and Information Governance.
3. Understand the concept of information Classification.
4. Study the concepts of Risk Management.
5. Introduce for Information Governance For Delivery Platforms

**Unit I-** Information Governance Concepts, Definitions, And Principles

Big Data Impact - Defining Information Governance - Failures in Information Governance- Form IG Policies, Then Apply Technology for Enforcement- Data Governance - Data Governance Strategy Tips - IT Governance - IT Governance Frameworks - Impact of a Successful IG Program- InformationGovernancePrinciples - Accountability is Key - Generally Accepted Recordkeeping Principles - Assessment and Improvement Roadmap - Information Security Principles - Privacy Principles - Who Should Determine IG Policies.

**UNIT II-POLICY DEVELOPMENT (10)**

Policy Definitions- Policy, Standards, Guidelines, and Procedures: Definitions and Examples - Policy Key Elements-Policy Format and Basic Policy Components-Policy Content Considerations Program Policy Examples.Topic-Specific Policy Examples - Business Goals versus Security Goals - Computer Security Objectives - Mission Statement Format - Allocation of Information Security Responsibilities (ISO 17799–4.1.3) - Mission Statement Examples - Support for the Mission Statement– standards.

**UNIT III- INFORMATION CLASSIFICATION (12)**

Introduction - Why Classify Information- What Is Information Classification? -Establish a Team - Developing the Policy -Resist the Urge to Add Categories -What Constitutes Confidential Information- Classification Examples-Declassification or Reclassification of Information- Information Classification Methodology-Authorization for Access - Information Asset Risk Planning and Management - The Information Risk Planning Process - Create a Risk Profile - Information Risk Planning and Management Summary – IG reference model - Information Security Management Metrics.

**UNIT IV- THE INFORMATION RISK MANAGEMENT PROGRAMME (10)**

The Information Risk Management - Risk Identification - Threat and Vulnerability Assessment - Risk Analysis and Risk Evaluation – Risk Treatment – Risk Reporting and Presentation.

**UNIT V-INFORMATION GOVERNANCE FOR DELIVERY PLATFORMS (8)**

Information Governance for E-Mailand Instant Messaging - Information Governance for SocialMedia - Information Governance for Mobile Devices - Information Governance for Cloud Computing–Leveraging and Governing Emerging Technologies.

**Text Books**

1. Information Governance: Concepts, Strategies, And Best Practices, Second Edition, Wiley Publications by Robert F. Smallwood
2. Information security Policies,Standards and procedures by Thomas R.Peltier CRC press
3. Information Security Governance: A Practical Developmentand Implementation Approach, Wiley Publications,2009 by KragBrotby
4. Information Risk Management: A Practitioner’s Guide, Second edition, by David Sutton.

**Reference Book**

1. Information Security Governance, Springer, by S. H. Von Solms and R. Von Solms
2. IT Governance and Information Security: Guides, Standards and Frameworks, CRC Press, by Yassine Maleh, AbdelkebirSahid,MamounAlazab, Mustapha Belaissaoui.

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | 3 | 2 |
| CO2 | 3 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | 3 | 2 |
| CO3 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | 2 |
| CO4 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| CO5 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 3 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**III B.Tech II Semester CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 4 |

**20ACS86** **SECURITY ASSESSMENT AND RISK ANALYSIS**

**Course Outcomes:**

After Completion of the course the student will be able to:

1. Design information security risk management framework and methodologies
2. Identify and modeling information security risks
3. Judge the difference between qualitative and quantitative risk assessment methods
4. Articulate information security risks as business consequences

**UNIT 1** **9 Hrs**

**SECURITY BASICS**: Information Security (INFOSEC) Overview: critical information characteristics – availability information states – processing security countermeasures education, training and awareness, critical information characteristics – confidentiality critical information characteristics – integrity, information states – storage, information states – transmission, security counter measures policy, procedures and practices, threats, vulnerabilities.

**UNIT II** **9 Hrs**

**Threats to and Vulnerabilities of Systems**: definition of terms (e.g., threats, vulnerabilities, risk), major categories of threats (e.g., fraud, Hostile Intelligence Service (HOIS), malicious logic, hackers, environmental and technological hazards, disgruntled employees, careless employees, HUMINT, and monitoring), threat impact areas, Countermeasures: assessments (e.g., surveys, inspections), Concepts of Risk Management: consequences (e.g., corrective action, risk assessment), cost/benefit analysis of controls, implementation of cost effective controls, monitoring the efficiency and effectiveness of controls (e.g., unauthorized or inadvertent disclosure of information), threat and vulnerability assessment)

**UNIT III** **8Hrs**

**Security Planning: directives and procedures for policy mechanism, Risk Management**: acceptance of risk (accreditation), corrective actions information identification, risk analysis and/or vulnerability assessment components, risk analysis results evaluation, roles and responsibilities of all the players in the risk analysis process, Contingency Planning/Disaster Recovery: agency response procedures and continuity of operations, contingency plan components, determination of backup requirements, development of plans for recovery actions after a disruptive event, development of procedures for offsite processing, emergency destruction procedures, guidelines for determining critical and essential workload, team member responsibilities in responding to an emergency situation.

## UNIT IV 8 hrs

**POLICIES AND PROCEDURES**: Physical Security Measures: alarms, building construction, cabling, communications centre, environmental controls (humidity and air conditioning), filtered power, physical access control systems (key cards, locks and alarms), Personnel Security Practices and Procedures: access authorization/verification (need to know), contractors, employee clearances, position sensitivity, security training and awareness, systems maintenance personnel, Administrative Security Procedural Controls: attribution, copyright protection and licensing , Auditing and Monitoring: conducting security reviews, effectiveness of security programs, investigation of security breaches, privacy review of accountability controls, review of audit trails and logs

## UNIT V 10hrs

**Operations Security (OPSEC):** OPSEC surveys/OPSEC planning INFOSEC: computer security – audit, cryptography encryption (e.g., point to point, network, link), cryptography key management (to include electronic key), cryptography strength (e.g., complexity, secrecy, characteristics of the key) Case study of threat and vulnerability assessment.

**TEXT BOOK:**


1. Whitman & Mattord, Principles of Incident Response and Disaster Recovery, Course Technology ISBN:141883663X

2. (Web Link) http://www.cnss.gov/Assets/pdf/nstissi_4011.pdf


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 |
| C02 | 3 | 3 | 1 | - | - | - | - | - | - | - | 2 | - | 2 | - |
| C03 | 3 | 2 | 3 | - | 1 | - | - | - | - | - | 2 | 3 | 2 | - |
| C04 | - | 1 | 2 | 1 | 1 | - | - | - | - | - | - | 2 | - | 1 |

.

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Semester CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | 1 | - | 4 |

**20ACS87 DATABASE SECURITY AND ACCESS CONTROL**

**Course Outcomes:**

At the end of the course the student will be able to: After Completion of the course the student will be able to:

1. Gain complete knowledge on database security problems and make a study on level 1 security models.
2. Understand the concepts of User Identification/Authentication and trusted computer systems in level 2 security models.
3. Classify the different design issues related to

a. Security Software and Secure Operating System
b. Secure DBMS and Security Packages
c. Statistical Database Protection & Intrusion Detection Systems

4. Understand the level 1 models for protection of new generation database systems specially for the protection of Object Oriented System.
5. Analyze the Orion Model, ajodia and Kogan's Model under the level 2 models for database systems protection.

**UNIT- I:**

**Introduction:** Introduction to Databases Security Problems in Databases Security Controls Conclusions Security Models -1: Introduction Access Matrix Model Take-Grant Model Acten Model PN Model Hartson and Hsiao's Model Fernandez's Model Bussolati and Martella's Model for Distributed databases

**UNIT-II:**

Security Models -2: Bell and LaPadula's Model Biba's Model Dion's Model Sea View Model Jajodia and Sandhu's Model The Lattice Model for the Flow Control conclusion

Security Mechanisms: Introduction User Identification/Authentication Memory Protection Resource Protection Control Flow Mechanisms Isolation Security Functionalities in Some Operating Systems Trusted Computer System Evaluation Criteria

**UNIT- III:**

Security Software Design: Introduction A Methodological Approach to Security Software Design Secure Operating System Design Secure DBMS Design Security Packages Database Security Design Statistical Database Protection & Intrusion Detection Systems: Introduction Statistics Concepts and Definitions Types of Attacks Inference Controls evaluation Criteria for Control Comparison. Introduction IDES System RETISS System ASES System Discovery

**UNIT- IV:**

Models for the Protection of New Generation Database Systems -1: Introduction A Model for the Protection of Frame Based Systems A Model for the Protection of Object-Oriented Systems SORION Model for the Protection of Object-Oriented Databases

**UNIT-V:**

Models for the Protection of New Generation Database Systems -2: A Model for the Protection of New Generation Database Systems: the Orion Model ajodia and Kogan's Model A Model for the Protection of Active Databases Conclusions

**TEXT BOOK:**

1. Database Security by Castano Pearson Edition (lie) Database Security and Auditing: Protecting Data Integrity and Accessibility, 1st Edition, Hassan Afyouni, THOMSON Edition.

**REFERENCE BOOK:**

1. Database security by alfred basta, melissazgola, CENGAGE learning.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | - |
| C02 | 3 | 3 | 1 | - | - | - | - | - | - | - | 2 | - | 2 | - |
| C03 | 3 | 2 | 3 | - | 1 | - | - | - | - | - | 2 | 3 | 2 | - |
| C04 | - | 1 | 2 | 1 | 1 | - | - | - | - | - | - | 2 | - | 1 |
| C05 | - | - | - | 1 | 1 | - | - | - | - | - | - | 1 | - | 1 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

### II B.Tech II Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML))

| L | T | P | C |
|---|---|---|---|
| 3 | - | 2 | 4 |

### 20ACS88 OPERATING SYSTEMS AND SYSTEM PROGRAMMING

**Course Outcomes:**

After Completion of the course the student will be able to

1. Apply the knowledge of operating system fundamental concepts to manage the computer resources.
2. Evaluate the performance of scheduling algorithms which is best suited in a multiprogramming environment.
3. Develop an algorithm to check the resources are effectively used in an operating system's component in a shared environment

Analyze an operating system's components to manage the user data

**UNIT I**

**INTRODUCTION TO SYSTEMS** PROGRAMMING

Introduction: Components of System Software, Language Processing Activities, Fundamentals of Language Processing Assemblers: Elements of Assembly Language Programming

A simple Assembly Scheme, Pass structure of Assemblers, Design of Two Pass Assembler, Single pass assembler Macro Processor: Macro Definition and call, Macro Expansion, Nested Macro Calls and definition, Advanced Macro Facilities, Design of Macro Processor

**UNIT II**

**INTRODUCTION TO OS AND SCHEDULING**

OS Design issues - Structuring methods (monolithic, layered, modular, micro-kernel models) Overview of computer operating systems, operating systems structures: operating system services and systems calls, system programs, operating system structure Process concepts, Cooperating processes, Inter process communication. CPU Scheduling: Basic concepts, Scheduling criteria, Algorithms, and their evaluation.

**UNIT III**

**PROCESS SYNCHRONIZATION & DEADLOCK**

Process synchronization, The critical-section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions. Deadlocks: System model, deadlock characterization, Methods for handling deadlock, deadlock prevention, detection and avoidance, recovery form deadlock.

## UNIT IV

### MEMORY MANAGEMENT STRATEGIES

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory: demand paging, page replacement, algorithms, allocation of frames, Thrashing case studies UNIX, Linux, Windows 100

## UNIT V

### FILE SYSTEM INTERFACE

File concepts, Access Methods, Directory structure, File system mounting, File sharing, protection. File System implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, Mass-storage structure: Disk structure, disk scheduling, disk management, swap-space management and disk attachment.

## LIST OF EXPERIMENTS

1. Implement the various process scheduling mechanisms such as FCFS, SJF, Priority, round – robin.
2. Implement the solution for dining philosopher's problem.
3. Implement banker's algorithm.
4. Implement the first fit; best fit and worst fit file allocation strategy.
5. Write a C program to simulate page replacement algorithms a) FIFO b) LRU
6. Write a C program to simulate disk scheduling algorithm a)FIFO b)SCAN c)CSCAN

## Text Books:

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, Wiley (2012).

## Reference Books:

1. Ramez Elmasri, A Carrick, David Levine, Operating Systems, A Spiral Approach - McGrawHill Science Engineering Math (2009).

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | **3** | **2** | **1** | | | | | | | | | | **3** | **3** |
| **CO2** | **3** | **3** | **2** | **3** | **1** | | | | | | | | **3** | **3** |
| **CO3** | **3** | **2** | **1** | | | | | | | | | | **3** | **3** |
| **CO4** | **3** | **2** | | | | | | | | | | | **3** | **3** |

MINOR DEGREE

# SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**III B.Tech I Semester CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | - | 2 | 4 |

**20ACS89** **DATABASE MANAGEMENT SYSTEMS** (Minor)

## Outcomes:

After Completion of the course the student will be able to:

1. Design a Data warehouse system and perform business analysis with OLAP tools.
2. Apply suitable pre-processing and visualization techniques for data analysis
3. Apply frequent pattern and association rule mining techniques for data analysis
4. Apply appropriate classification and clustering techniques for data analysis

## UNIT I 9Hrs

**Introduction:** Purpose of Database Systems, View of Data, Database and Application Architecture, Structure of Relational Databases, Database Schema, Keys. Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions. Join Expressions, Views, Transactions, Integrity Constraints, SQL Data Types and Schemas, Index Definition in SQL, Authorization.

## UNIT-II 8Hrs

**Database Design Using the E-R Model:** Overview of the Design Process, The Entity-Relationship Model, Complex Attributes, Mapping Cardinalities, Primary Key, Removing Redundant Attributes in Entity sets.

**Relational Database Design:** Features of Good Relational Designs, Decomposition Using Functional, Dependencies, Normal Forms, Functional-Dependency Theory, Algorithms for Decomposition Using Functional Dependencies, Decomposition Using Multivalued Dependencies, Atomic Domains and First Normal Form, Database-Design Process, Modeling Temporal Data.

## UNIT III 9Hrs

**Transactions:** Transaction Concept, A Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity, Transaction Isolation Levels.

**Concurrency Control:** Lock-Based Protocols, Deadlock Handling, Multiple Granularity, Timestamp-Based Protocols.

**Recovery System:** Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Non-Volatile.

## UNIT IV 8Hrs

**Storage and File Structure:** Overview of Physical Storage, Media, Magnetic Disk and Flash Storage, RAID, Tertiary Storage File Organization, Organization of Records in Files, Data-Dictionary Storage, Database Buffer.

**Indexing:** Basic Concepts, Ordered Indices, B+-Tree Index Files, B+-Tree Extensions, Hash Indices, Multiple-Key Access.

**Query Processing:** Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation.

## UNIT V 8Hrs

**Advanced Application Development**: Performance Tuning, Performance Benchmarks.

**Database-System Architectures:** Overview, Centralized Database Systems, Server System Architectures, Parallel Systems, Distributed Systems, Transaction Processing in Parallel and Distributed Systems, Cloud-Based Services.

**Parallel and Distributed Storage:** Overview, Data Partitioning, Dealing with Skew in Partitioning, Replication, Parallel Indexing, Distributed File Systems, Parallel Key-Value Stores.

**LIST OF EXPERIMENTS**

1. Creation, altering and dropping of tables and inserting rows into a table (use constraintswhile creating
tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOT EXISTS, UNION,
INTERSECT, EXCEPT operators.. Example:, Select the roll number and name of thestudent who
secured fourth rank in the class.
3. Using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY,HAVING ,Creation and dropping of Views.
4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
5. i) Creation of simple PL/SQL program which includes declaration section, executable section and exception –handling section (Ex. Student marks can be selected from the tableand printed for those who secured first class and an exception can be raised if no records were found)

i) Implement COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
6. Develop a program that includes the features NESTED IF, CASE and CASE expression.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops usingERROR Handling, BUILT –IN Exceptions, USE defined Exceptions.
8. Program development using the creation of stored functions, invoke functions in SQLStatements and write complex functions.

**TEXT BOOKS:**

1. Raghurama Krishnan, Johannes Gehrke, “Data base Management Systems”,
TATA McGraw,Hill 3rd Edition,2007.
2. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, “Database System Concepts”, Fifth Edition, Tata McGraw Hill, 2006.
3. Ivan Bayross, ”SQL, PL/SQL programming language of Oracle”, BPB
Publications 4th edition, 2010.

REFERENCE BOOKS:

1. Peter Rob, Carlos Coronel, Database Systems Design Implementation andManagement, 7th edition, 2009.
2. Scott Urman, Michael McLaughlin, Ron Hardman, “Oracle database 10g PL/SQL programming “,6th edition, Tata McGraw Hill,2010
3. S.K.Singh, “Database Systems Concepts, Design and Applications”, First edition,
Pearson Education, 2006.
4. Ramez Elmasri, Shamkant B. Navathe, “Fundamentals of Database Systems”, FourthEdition, Pearson / Addision wesley, 2007.
5. Ashutosh Kumar Dubey,” Database Management Concepts”, 3rd edition,S.K.Katari& Sons,2008.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | **3** | **3** | - | - | - | - | - | - | - | - | - | - | **2** | **2** |
| C02 | **3** | **3** | **3** | - | - | - | - | - | - | - | - | - | **2** | **2** |
| C03 | - | **3** | **3** | **2** | - | - | - | - | - | - | - | - | **2** | **2** |
| C04 | - | - | **3** | **2** | - | - | - | - | - | - | - | - | **2** | **2** |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)**

**III B.Tech II Semester CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | - | 2 | 4 |

# 20ACS90 R PROGRAMMING

## Course Outcomes:

After Completion of the course the student will be able to:

1. Apply the basics of R programming and its functions
2. Apply the package concepts in R
3. Explore data analysis with objects and computation
4. Implement graphics with R.

## UNIT- I (8)

**Introduction to R**: Starting R – Installation- Data objects in R – Data Import and Export – Data Manipulation – Computing with data – Organizing an analysis

## UNIT-II (8)

**Programing with R:** Introduction, Data Structures, Managing R Session, Language Basics, Subscripting and subseting, Vectoized computations, Replacement functions, Functional Programming, Writitng functions, Flow control, Exception handling.

**Object-oriented programming in R:** Introduction, The basics of OOP, S3 OOP, s4 OOP, Documentation, Debugging

## UNIT-III (8)

**Working with Data**: Input and output in R: Introduction, Basic file handling, Connection, File input and output, sources and sink. Character data introduction: Built-in capabilities, Regular expressions, Prefixes, suffixes and substrings, Matching patterns.

## UNIT-IV (8)

**Data Manipulation**: Reading Data, Examples of Reading and formatting datasets, Manipulating data with dplyr: dplyr functions, Tidying data with tidlyr.

## UNIT-V (8)

**R Packages and Graphic:** Creating a R packages, Package Names, The structure of an R package, Namespace, Roxygen, Adding data to your package, Building an R Package, Base R Graphics, The grammar of graphics and the ggplot2 packages, Figures with multiple plots.

## List of Experiments

1. Implementation of vector data objects operations
2. Implementation of matrix, array and factors and perform va in R
3. Implementation and use of data frames in R .
4. Create Sample (Dummy) Data in R and perform data manipulation with R
5. Study and implementation of various control structures in R
6. Data Manipulation with dplyr package
7. Data Manipulation with data.table package
8. Study and implementation of Data Visualization with ggplot2
9. Study and implementation data transpose operations in R

## TEXT BOOK:


1. Hothorn, Torsten, and Brian S. Everitt. A handbook of statistical analyses using R. Chapman and Hall/CRC, 2006.
2. Gentleman, Robert. R programming for bioinformatics. Chapman and Hall/CRC, 2008.
3. Mailund, Thomas. Beginning Data Science in R. California: Apress, 2017.


## REFERENCE BOOKS:


1. Nicholas J. Horton, Ken Kleinman," Using R and RStudio for Data Management, Statistical Analysis, and Graphics" , CRC Press, Second edition, 2015
2. Eric D. Kolaczyk, "Statistical Analysis of Network Data with R", Springer, 2014
3. John Maindonald, W. John Braun,"Data Analysis and Graphics 193 Using R: An Example-Based Approach", University Press, Cambridge, Third edition, 2010.
4. John M. Quick," Statistical Analysis with R", Packt Publishing , 2010.


| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | 2 | - | 1 | - | - | - | - | - | - | - | - | 2 | - |
| C02 | 3 | 3 | 1 | 1 | - | - | - | - | - | - | 2 | - | 2 | - |
| C03 | 3 | 2 | 3 | 2 | 1 | - | - | - | - | - | 2 | 3 | 2 | - |
| C04 | - | 1 | 2 | 1 | 1 | - | - | - | - | - | - | 2 | - | 1 |

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNO**
**(AUTONOMOUS)**
**III B.Tech II Semester CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | - | 2 | 4 |

**20ACS91** **JAVA PROGRAMMING(Minor)**

## Course Outcomes:

After Completion of the course the student will be able to:

1. Apply object-oriented concepts are incorporated into the Java programming Language.
2. Apply error handling techniques.
3. Develop JAVA application using applets.
4. Develop JAVA application to adopt collections and packages.

## UNIT- I (8)

**Object Oriented programming**: Two paradigm, abstraction, The three oops principles. JAVA BASICS: Two control statements, Using Blocks of code, Lexical Issues. Data types, Variables and Arrays, Operators, Control statements.

## UNIT-II (8)

**OOPs classes and Objects**: Introducing classes, Class fundamentals, Declaring objects , Assigning object reference variables, Introducing methods, Constructors, The this keyword, Inheritance, Inheritance basics, using super, creating multilevel hierarchy, Method overriding,

## UNIT-III (8)

**Packages and Interfaces:** Packages: Defining package, Finding Package and CLASSPATH, Packages and member access, importing packages, Interfaces: Definition an Interface, implementing interfaces, Nested Interfaces, applying interfaces, variables in interface and extending interfaces, Use static methods in an interface.

## UNIT-IV (8)

**Exception Handling:** Exception handling fundamentals, exception types, uncaught exceptions, usage of try, catch, throw, throws and finally, built- in exceptions, creating own exception sub classes. MULTI THREADING: The java thread model, the main thread, creating threads, Thread priorities, synchronization, inter thread communication.

**UNIT-V (8)**

**Introducing the AWT: Working with Windows, Graphics, and Text:** AWT classes, Window Fundamentals, working with frame windows, Introducing graphics: Drawing Lines, Rectangles, Arcs,Ploygon,Working with color, Working with Fonts, AWT control fundamentals, Labels, Using buttons, Applying check boxes, Using Lists, Using a TextArea.

## List of Experiments

1. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
2. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
3. Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use String Tokenizer class of java.util)
4. Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
5. Write a Java program that displays the number of characters, lines and words in a text file
6. Write a Java program for sorting a given list of names in ascending order. c) Write a Java program to make frequency count of words in a given text.
7. Develop an applet that displays a simple message
8. Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named ―Compute is clicked.

## TEXT BOOK:

Herbert schildt, “The complete reference JAVA”, 12th edition, Tata Mcgraw Hill, New Delhi, 2021.

## REFERENCE BOOKS:

1. Simon Kendal “Object Oriented Programming Using JAVA”, 2010.
2. Cosmina, Iuliana. Java for Absolute Beginners: Learn to Program the Fundamentals the Java 9+ Way. Apress, 2018.
3. Liang, Y. Daniel. Introduction to Java programming and data structures. Pearson Education, 2018.

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 3 | 2 | - | 1 | - | - | - | - | - | - | - | - | 2 | - |
| C02 | 3 | 3 | 1 | 1 | - | - | - | - | - | - | 2 | - | 2 | - |
| C03 | 3 | 2 | 3 | 2 | 1 | - | - | - | - | - | 2 | 3 | 2 | - |
| C04 | - | 1 | 2 | 1 | 1 | - | - | - | - | - | - | 2 | - | 1 |

## SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

**IV B.Tech I Semester CSE**

| L | T | P | C |
|---|---|---|---|
| 3 | - | 2 | 4 |

**20ACS92** **App Development Using Android**(Minor)

**COURSE OUTCOMES**

After Completion of the course the student will be able to:

1. Describe the basics Concept of Android Application
2. Understand different Activities, Fragments. Intents used for development of Android Application.
3. Analyze the User interface Components for Android Application
4. Designing User Interface With Views for Android Application
5. Applying Data Persistence with Android Applicaiton

**UNIT I**

Getting Started With Android Programming- Android Versions-Features of Android-Architecture of Android- -Obtaining the Required Tools-Android Studio-Android SDK-Creating Android Virtual Devices (AVDs)- Your First Android Application.

Using Android Studio For Android Development-Exploring the IDE-Debugging Your Application-Setting Breakpoints-Navigating Paused Code

**UNIT II**

Activities, Fragments, And Intents-Understanding Activities-Applying Styles and Themes to an Activity-Hiding the Activity Title-Displaying a Dialog Window-Displaying a Progress Dialog-Linking Activities Using Intents-Returning Results from an Intent-Passing Data Using an Intent Object-Fragments-Adding Fragments Dynamically-Life Cycle of a Fragment-Interactions Between Fragments-Understanding the Intent Object-Using Intent Filters-Displaying Notifications**.**

**UNIT III**

The Android User Interface-Understanding the Components of a Screen-LinearLayout (Horizontal) and Linear Layout (Vertical)-TableLayout-RelativeLayout-FrameLayout - ScrollView-Adapting to Display Orientation-Anchoring Views-Managing Changes to Screen Orientation-Persisting State Information During Changes in Configuration-Detecting Orientation Changes-Controlling the Orientation of the Activity--Utilizing the Action Bar-Adding Action Items to the Action Bar-Creating the User Interface Programmatically-Listening for UI Notifications.

UNIT IV

Designing Your User Interface With Views-Using Basic Views-TextView View-Button, ImageButton, EditText, CheckBox, ToggleButton,RadioButton, and RadioGroup Views-Progress View-AutoCompleteText View-User Piceker Views-Using List Views to Display Long Lists-Understanding Specialized Fragments

Dispaying pictures and menus with views-Using Image views to Display Pictures-Using menus with view using webview-.

**UNIT 5**

**Data Persistence-**Saving and Loading User Preferences-Persisting Data to Files-Creating and using Databases-Messaging-SMS messaging-Sending SMS messages programmatically-Sending SMS Messages using Intent-Receiving SMS Messages-Cavets and warning-Sending Emails.

Location Based Services-Displaying Maps-Creating the Project-Obtaing the Maps API key-Displaying the map-Displaying Zoom control-Changing Views-Navigating to a specific Location.

TEXT BOOK

1.Begining Android Programming with Android Studio,J.F.Dimarzio, Wiley,2017

2. Lauren Darcey and Shane Conder, “Android Wireless Application Development”, Pearson Education, 2nd ed. (2011)

REFERENCE BOOKS:

1. Reto Meier, “Professional Android 2 Application Development”, Wiley India Pvt Ltd
2. Mark L Murphy, “Beginning Android”, Wiley India Pvt Ltd
3. Android Application Development All in one for Dummies by Barry Burd, Edition

## List of Experiments

**Task1-** Create a basic app to display the student details as Name, Roll No, Section and Phone No

**Task2 -**Create an application that takes the name from a text box and shows hello message along with the name entered in text box, when the user clicks the OK button.

**Task3-**Create a screen that has input boxes for User Name, Password, Address, Gender(radio buttons for male and female), Age (numeric), Date of Birth (Date Picket), State (Spinner) and a Submit button. On clicking the submit button, print all the data below the Submit Button (use any layout)

**Task4**- Design an android application Send SMS using Intent

**Task5-**Develop an Android application using controls like Button, Text View, Edit Text for designing a calculator having basic functionality like Addition, Subtraction, Multiplication and Division.

**Task6** – Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 secs

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 2 | 2 |
| CO2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 1 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 1 | - | - | - | - | - | - | 1 | - | 2 | 2 |
| CO4 | 3 | 3 | 2 | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 |
| CO5 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | - | 3 | 3 |