ACADEMIC REGULATIONS-R20
COURSE STRUCTURE AND DETAILED SYLLABI

B. TECH REGULAR (FULL-TIME) FOUR YEAR DEGREE PROGRAMME
(FOR THE BATCHES ADMITTED FROM THE ACADEMIC YEAR 2022-23)

BACHELOR OF TECHNOLOGY
FOR

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

(For the Batches Admitted From 2022-2023)

&

B. Tech (Lateral Entry Scheme)

(For the Batches Admitted From 2022-2023)

COMPUTER SCIENCE AND ENGINEERING

(CYBER SECURITY)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
Accredited by NBA, New Delhi & NAAC, Bengaluru │Affiliated to JNTUA, Ananthapuramu, Recognized by the UGC under Section 12 (B) and 12 (F)│ Approved by AICTE, New Delhi.
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FOREWORD

The autonomy conferred Sri Venkateswara College Engineering and technology by JNT University, Ananthapuramu based on performance as well as future commitment and competency to impart quality education. Itis a mark of its ability to function independently in accordance with the set norms the monitoring bodies UGC and AICTE. It reflects the confidence of the affiliating University in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awardsdegrees on behalf of college. Thus, an autonomous institution is given the freedom to have its own curriculum, examination system and monitoring mechanism, independent of the affiliating University but under its observance.

Sri Venkateswara College of Engineering and Technology is proud to win the confidence of all the above bodies monitoring the quality in educationand has gladly accepted the responsibility of sustaining, the standards and ethics it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education.

As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Bodyof the College and recommendations of the JNTUA, Ananthapuramu to frame the regulations, course structure and syllabi under autonomous status.

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

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

Principal

Vision, Mission, Quality Policy of the Institute

Vision

- To carve the youth as dynamic, competent, valued and knowledgeable professionals who shall lead the Nation to a better future and to mould the institution into a Academic Excellence and Advanced Research.

Mission

- To provide quality education, student-centered teaching- learning processes and state-of-art infrastructure for professional aspirants hailing from both rural and urban areas.
- To impart technical education that encourages independent thinking, develops strong domain of knowledge, own contemporary skills and positive attitudes towards holistic growth of young minds.

Quality policy

Sri Venkateswara College of Engineering and Technology strides towards excellence by adopting a system of quality policies and processes with continued improvements to enhance student's skills and talent for their exemplary contribution to the society, the nation and the world.

Vision and Mission of the Department under R20 Regulations

Department Vision:

- To develop as a Centre of Excellence in the diverse areas of Computer Sciences through teaching, innovation, research and collaboration there by addressing the challenges of emerging needs.

Department Mission:

- Produce globally competent professionals in through delivering knowledge in emerging technologies of computer science to solve real world problems.
- Develop domain and research skills that enable them to undertake challenging careers and pursue Higher Education.
- Imbibe morals and values among students for developing a strong professional etiquette and with a zeal for continuous learning.
- Create an ecosystem for faculty to develop further in domain competence, research aptitude and pedagogical skills.
- Develop infrastructure and facilities for different academic and research activities.

Program Educational Objectives (PEOs) under R20 Regulations

Program Educational Objectives (PEOs):

After successful completion of the program the graduates will be able to:

- Seek careers as successful professionals in Cyber Security with holistic perspective to computer sciences and its allied areas.
- Pursue Higher Education and Research in emerging areas of Computer Sciences with a focus on Cyber Security.
- Forge into Entrepreneurship in varied areas of Computer sciences and Cyber security.
- Engage into Lifelong Learning to continuously up skill to suit the contemporary industry needs and Development.

Program Specific Outcomes (PSOs) under R20 RegulationsProgram Specific Outcomes (PSOs):

After successful completion of the Programme, the students will be able to

- Demonstrate the knowledge of Computer Sciences and Cyber Security specially in the broad areas of Computer Programming, Database Management, Data Security, System Security and Network Security.
- Develop analytical and design skills pertaining to Computer Sciences and Cyber Security to solve complex and real time engineering problems and systems.
- Solve problems using existing tools or designing new tools and techniques in the domains of Computer Sciences and Cyber Security in compliance to ethical norms and standards.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

R.V.S. Nagar, CHITTOOR – 517 127, A.P

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(**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 2022-23)

and

B.Tech. (Lateral Entry Scheme)

(For the batches admitted from the academic year 2022-23)

1. Applicability : All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic year 2020-2021 onwards. Any reference to "College" inthese 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 conductedby 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 areto 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 Hrs of teaching. The choice based credit system provides a 'cafeteria' type approach in which the students can take courses of their choice, learnat 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 skillsto 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

9. 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 Hrs per week will be assigned. Each Theory and Laboratory course carries credits based on the number of Hrs / week as follows.

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

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 offeredto students of all branches in general. However, a student shall choose an open Electivefrom thelist 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 mustbe 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 hasto re-register and complete the same. In case any provider discontinues the course, Institutionshall allow the student to opt for any other course from the list provided by the department fromtime 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 bythe 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.TechI 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'sTaxonomy.Time duration for each sessional exam is 2 Hrs. 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 Hrs duration. The syllabus for the theorycourse 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 thembeing 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 studentsin advance by the concerned Chairman, BOS and displayed in the laboratory during the beginningof 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 Hrs 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 / Onthe 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 endofsecond 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. Astudent will be required to submit a summer internship report to the concerned departmentandappear 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 parallellyhe 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 carriedout 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 ofinternships is mandatory, if any student fails to complete internship, he will not be eligiblefor the award of degree. In such cases, the student shall repeat and completethe internship.

11.11 Framework for Skill Oriented Courses:

11.11.1 For skill oriented/skill advanced courses, one theory and 2 practical Hrs or two theoryHrs 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 necessarilybe 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 withthe 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 bythe 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 everyyear 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 offeredby the Department, the credits shall be awarded to the student upon producingthe Course Completion Certificate from the agency / professional bodies as approved bythe 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 creditsassigned to the course.

11.11.8 A committee shall be formed at the level of the college to evaluate the grades / marksgiven 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 onwardsand must opt for a Minor in a discipline other than the discipline he is registered in or any industryrelevant 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% ofthe 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, firstclassand 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 takenfor 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 MOOCcourses 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.

10. 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.

11. 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 areconverted 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 Principaland 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 h 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 thesum 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 numberof 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 Cumulative Grade Point Average (CGPA) will be computed in the same manner takinginto account all the courses undergone by a student over all the semesters of a program, i.e.

$$CGPA = \Sigma (Ci \times Si) / \Sigma C_i$$

where 'Si' is the SGPA of the i^{th} semester and Ci 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 activitiesand 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 Hrs 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 halland 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 halland 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 halland cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled.
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 isan 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 towalk 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. 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.	

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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

Semester-0 **Regulations:R20**

S.No	Category	Course code	Course title	Hrs per week			Credits
				L	T	P	
1	MC		Physical Activities -- Sports, Yoga and Meditation, Plantation	0	0	6	0
2	MC		Career Counselling	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
	ES		Proficiency Modules & Productivity Tools	2	1	2	0
5	MC		Assessment on basic aptitude and mathematical skills	2	0	3	0
6	MC		Remedial Training in Foundation Courses	2	1	2	0
7	MC		Human Values & Professional Ethics	3	0	0	0
8	BS		Communication Skills -- focus on Listening, Speaking, Reading, Writing skills	2	1	2	0
9	ES		Concepts of Programming	2	0	2	0
Total				**20**	**3**	**22**	**0**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (CYBER SECURITY)

Course Structure & Scheme of Examination

I B.Tech I Semester-CSE (CS) **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	HS	20AHS01	Communicative English	3	0	0	3	40	60	100
3	BS	20AHS03	Engineering Chemistry	3	0	0	3	40	60	100
4	ES	20ACS01	C Programming and Data Structures	3	1	0	3	40	60	100
5	ES	20ACS02	Computational Thinking	3	0	0	3	40	60	100
6	HS	20AHS05	Communicative English 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	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				**15**	**2**	**13**	**19.5**	**420**	**480**	**900**

I B.Tech II Semester-CSE(CS)

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	20AHS04	Engineering Physics	3	0	0	3	40	60	100
2	ES	20AME01	Computer Aided EngineeringDrawing	1	0	4	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	ES	20AME02	Engineering Practice Lab	0	0	3	1.5	40	60	100
7	ES	20ACS05	Problem Solving and Programming using Python Lab	0	0	3	1.5	40	60	100
8	BS	20AHS07	Engineering Physics Lab	0	0	3	1.5	40	60	100
9	MC	20AHS09	Environmental Sciences	2	0	0	-	100	00	100
10			NSS/NCC	0	0	2	-			
TOTAL				**19**	**3**	**9**	**19.5**	**420**	**480**	**900**

II B.Tech., I Semester

S.NO	Category	Course code	Course Title	Hours per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
1	BS	20AHS10	Numerical Methods	3	0	0	3	40	60	100
2	PC	20ACS06	Computer Organization and Architecture	3	0	0	3	40	60	100
3	PC	20AIT01	Automata & Compiler Design	3	0	0	3	40	60	100
4	PC	20ACS08	Relational Database Management Systems	3	0	0	3	40	60	100
5	PC	20ACS07	Object Oriented programming through JAVA	3	0	0	3	40	60	100
6	PC LAB	20ACS09	Object Oriented programming through JAVA lab	0	0	3	1.5	40	60	100
7	PC LAB	20AIT02	Automata & Compiler Design lab	0	0	3	1.5	40	60	100
8	PC LAB	20ACS10	Relational Database Management Systems Lab	0	0	3	1.5	40	60	100
9	SC	20ACC01	Shell Scripting with Linux	1	0	2	2	40	60	100
10	MC	20AMB02	Universal Human Values-I	2	0	0-	Non-credit	100	00	100
11	AC	20AHS11	Quantitative Aptitude and Reasoning-I	2	0	0	Non-credit	-	-	-
12	20ANSS1/ 20ANCC1	NSS/NCC		0	0	2	Non-credit	-	-	-
TOTAL				20	00	13	21.5	460	540	1000

II B.Tech., II Semester

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 and Graph Theory	3	0	0	3	40	60	100
3	PC	20ACC02	Essentials Of Cyber Security	3	0	0	3	40	60	100
4	PC	20ACS13	Operating Systems	3	0	0	3	40	60	100
5	PC	20ACS12	Design and Analysis of Algorithms	3	0	0	3	40	60	100
6	ES/PC LAB	20ACC03	Essentials Of Cyber Security Lab	0	0	3	1.5	40	60	100
7	PC LAB	20ACS15	Operating Systems Lab	0	0	3	1.5	40	60	100
8	PC LAB	20ACS14	Design and Analysis of Algorithms Lab	0	0	3	1.5	40	60	100
9	SC	20ACD04	Data Analysis with R	1	0	2	2	40	60	100
10	AC	20AHS15	Quantitative Aptitude and Reasoning -II	2	0	0	Non-credit	-	-	-
TOTAL				**18**	**00**	**11**	**21.5**	**360**	**540**	**900**
Honor Degree hours distribution **4-0-0-4**										
Minor General Degree hours distribution **3-0-2-4** and Minor Industrial Relevant Track Degree hours distribution **4-0-0-4**										
Internship 2 Months (Mandatory) during summer vacation/Community Service project										

III B.Tech. I Semester

S.NO	Category	Course code	Course Title	Hours per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
1	HSS	20AMB03	Managerial Economics and Financial Analysis	3	0	0	3	40	60	100
2	PC	20ACC04	Cryptography	3	0	0	3	40	60	100
3	PC	20ACS17	Computer Networks	3	0	0	3	40	60	100
4	PE	**Professional Elective Courses-I**		3	0	0	3	40	60	100
		20ACC05	Data privacy							
		20ACC06	Wireless Network security							
		20ACS31	Ethical Hacking							
		20ACC07	Parallel Computer Architectures							
		20ACC08	Quantum computing							
5	OE/JOE	**Open Elective/ Job Oriented 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							
		20ACC09	Database Security							
		20ACS84	Steganography and Digital Watermarking							
6	PC LAB	20ACC10	Cryptography lab	0	0	3	1.5	40	60	100
7	PC LAB	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	20ACC11/20ACC12		Summer Internship / Community Service Project	0	0	0	1.5	40	60	100
TOTAL				22	00	8	**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**

III B. Tech, II Semester

S.NO	Category	Course code	Course Title	Hours per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
1	PC	20AIT04	Software Engineering	3	0	0	3	40	60	100
2	PC	20ACS16	Web Technologies	3	0	0	3	40	60	100
3	PC	20ACC13	System Security	3	0	0	3	40	60	100
4	PE	**Professional Elective Courses-II**		3	0	0	3	40	60	100
		20ACC14	Penetration Testing and Vulnerability Analysis							
		20ACC15	security program Management							
		20ACS70	Malware Analysis							
		20ACS72	High Performance Computing							
		20ACC16	Soft Computing							
5	OE/JOE	**Open Elective/ Job Oriented Elective -II**		3	0	0	3	40	60	100
		20AEC45	Microprocessor and Interfacing							
		20AMB09	Intellectual Property Rights							
		20AME31	Operations Research							
		20ACC17	Intrusion Detection Systems							
		20ACC18	Software Security							
6	PCLAB	20AIT05	Software Engineering Lab	0	0	3	1.5	40	60	100
7	PC LAB	20ACS25	Web Technologies lab	0	0	3	1.5	40	60	100
8	PC LAB	20ACC19	System Security Lab	0	0	3	1.5	40	60	100
9	SC	20ACC20	Penetration Testing	1	0	2	2	40	60	100
10	MC	20AHS23	Essence of Indian TraditionalKnowledge	2	0	0	-	100	-	100
TOTAL				18	0	11	**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

Industrial/Research Internship (Mandatory) 2 Months during summer vacation (to be evaluated during IV year, I Sem)

IV B.Tech. I Semester

S.No	Category	Course code	Course Title	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		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	Essential of Management Science							
2	PE	**Professional Elective Courses-III**		3	0	0	3	40	60	100
		20ACC21	Secure Coding Practices							
		20ACC22	Network Defense							
		20ACC23	Security and privacy in cloud							
		20ACC24	Biometric Computing							
		20ACC25	User Interface Design							
3	PE	**Professional Elective Courses-IV**		3	0	0	3	40	60	100
		20ACC26	Web Application Security							
		20ACS86	Security Assessment and Risk Analysis							
		20ACC27	Cyberspace Operations and Design							
		20ACC28	Software Architecture and Design Patterns							
		20ACC29	Decision Support and Intelligent Systems							
4	PE	**Professional Elective Courses-V**		3	0	0	3	40	60	100
		20ACC30	Cyber Forensics							
		20ACC31	Information security Management							
		20ACC32	Cyber Laws and security Policies							
		20ACS28	Internet Of Things							
		20ACM08	Deep Learning							
5	OE/JOE	**Open Elective/ Job Oriented Elective -III**		3	0	0	3	40	60	100
		20AEC56	Embedded systems							
		20AMB10	Industrial Marketing							
		20AME54	Optimization Techniques							
		20ACS39	cloud computing							
		20ACC33	Blockchain Technologies							
6	OE/JOE	**Open Elective/ Job Oriented Elective -IV**		3	0	0	3	40	60	100
		20AEC51	Digital Image Processing							
		20AMB11	Social Media Marketing							
		20AME20	Total Quality Management and Reliability Engineering							
		20ACC34	Operating systems Security							
		20ACC35	Machine Learning for Cyber Security							
7	SC	20ACS50	Source Code Management using Git and Github	1	0	2	2	40	60	100
8	MC	20AMB12	Professional Ethics	2	0	2	-	100	0	100
9	20ACC36		Industrial/Research Internship	0	0	0	3	40	60	100
TOTAL				21	00	4	**23**	**420**	**480**	**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**

IV B.Tech., II Semester

S. NO	Category	Course code	Course Title	Hours per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
1	Major Project	20ACC37	Project work, Seminar and Internship in Industry	0	0	24	12	40	60	100
	INTERNSHIP (6 MONTHS)									
TOTAL										**12**

LIST OF PROFESSIONAL ELECTIVES (PEs)

S. No.	Knowledge Area	PE-1	PE-2	PE-3	PE-4	PE-5
1	**Data and Software security**	Data Privacy	Penetration Testing and Vulnerability Analysis	Secure Coding Practices	Web Application Security	Cyber Forensics
2	**Component, Connection, System and organizational Security**	Distributed system Architecture	Security Assessment and Risk Analysis	Network Defense	Mobile and Wireless Security	security program Management`
3	**Human, Societal Security**	Ethical Hacking	Malware Analysis/social Engineering attacks	Security and privacy in cloud	Identity and Access Management	Cyber Laws and security Policies
4	**Architecture Design**	Parallel Computer Architectures	High Performance Computing	Grid Computing	Software Architecture and Design Patterns	IoT Architecture and Protocols
5	**Computational Science**	Computational Statistics	Soft Computing	User Interface Design	Decision Support and Intelligent Systems	Deep Learning

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
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	3	**1**	**0**	**3**

20AHS02 : DIFFERENTIAL EQUATIONS AND MULTIVARIABLE CALCULUS

Course Outcomes:

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

1. Classify and interpret the solution of ordinary differential equations.
2. Apply the principles of differential equations to the engineering and scientific problems.
3. Analyze the maxima and minima of functions of two or more variables.
4. Evaluate the double and triple integral to find surface area and volumes.
5. Compute the derivatives and line integrals of vector functions and learn their applications.

UNIT-I **9 Hrs**

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 **9 Hrs**

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 **9 Hrs**

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 three variables only.

UNIT-IV **9 Hrs**

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 **9 Hrs**

VECTOR CALCULUS: Gradient, Divergence, Curl and their properties (withoutidentities). **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 andothers, 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
CO1	3	2	-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	2	-	-	-	-	-	-	-	-
CO3	2	2	-	1	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-	-
CO5	3	2	-	2	-	-	-	-	-	-	-	-
Average	2.8	2	-	1.6	-	-	-	-	-	-	-	-
Level of correlation	3	2	-	2	-	-	-	-	-	-	-	-

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

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

L	T	P	C
3	0	0	3

20AHS03 : CHEMISTRY

Course Outcomes:

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

1. Understand the impact of hard water and its removal, apply the concept of estimation of hardness.
2. Analyze 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 **9 Hrs**

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 **12 Hrs**

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 **9 Hrs**

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 **11 Hrs**

FUELS AND COMBUSTION: Fuels, Classification of Solid, Liquid and Gaseous fuels - Analysis of coal - Proximate and Ultimate analysis - Refining of Petroleum - Preparation of syntheticpetrol - 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 **9 Hrs**

ELECTROCHEMICAL ENERGY SYSTEMS: Electrochemical Cells - Electrode potential - Standard electrode potential - Nernst equation - cell potential calculations - Basic conceptsof 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, 15th 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., 3rd 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.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1												

CO2	3	3												
CO3	3	2												
CO4	3	3												
Average	3	2.25												
Level of correlation	3	2												

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

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

1. Analyze the basic concepts of C Programming language.
2. Design applications in C, using functions, arrays, pointers and structures.
3. Apply the concepts of Stacks and Queues in solving the problems.
4. Explore various operations on Linked lists.
5. Demonstrate various tree traversals and graph traversal techniques.
6. Design searching and sorting methods

UNIT-1 7 hrs

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 10 hrs

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 8 hrs

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 10 hrs

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 9 hrs

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 HallPublication.
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. Ananda Rao,Pearson Education.
5. B.A. Forouzon and R.F. Gilberg, "COMPUTER SCIENCE: A Structured Programming Approach Using C", Thirdedition, 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.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3											3	2
CO2	3	3	3	1		7	8						3	2
CO3	3	3											3	3
CO4	3	3	1	2									3	2
CO5	3	3	2	3									3	3
CO6	3	3	3	2									3	2
Average	3	3	2.25	2									3	2.33

Level of Correlation	**3**	**3**	**3**	**2**									**2**	**3**

3-High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

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

L T P C

3 0 0 3

20AHS01 : COMMUNICATIVE ENGLISH

Course Outcomes:

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

1. Develop knowledge of basic grammatical concepts to understand asking and answering general questions on familiar topics and making paragraphs.
2. Interpret context, topic, and pieces of specific information from social or Transactional dialogues spoken by native speakers of English.
3. Examine language aspects to do role plays, to study graphic elements and information transfer.
4. Demonstrate discourse markers to make effective oral presentations and to write structured essays.

UNIT- I **10 Hrs**

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 **8 Hrs**

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 **11 Hrs**

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 **8 Hrs**

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 **8 Hrs**

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 Learners Vol. 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, Heinley ELT; 2nd Edition, 2018.

3.Skillful Level 2 Reading & Writing Student's Book Pack (B1) MacmillanEducation.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

CO1	**3**	**-**								**3**				
CO2	**2**	**2**								**3**				
CO3	**3**	**3**								**3**				
CO4	**3**	**-**							**3**	**3**				
Average	**2.75**	**2.5**							**3**	**3**				
Level of correlation	**3**	**3**							**3**	**3**				

3-High Mapping 2- Medium Mapping 1-Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

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

L T P C

3 0 0 3

20ACS02: COMPUTATIONAL THINKING

Course Outcomes:

At the end of the 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. Apply actions and data organizations in real time applications.
4. Analyze software correction, testing and performance measure using computer.

UNIT –I **8 hrs**

Computer, computer science and computational thinking, From Abacus to machine, the first software , what make it a modern computer ,the first computer,moores law, **How Real world data becomes computable Data:** Information and data, converting information to data, 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 8 hrs

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 9 hrs

M**odeling 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 7 hrs

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 8 hrs

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 BOOK:

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

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3												2	
CO2	3												2	
CO3	3	2	1	3									3	2
CO4	3	3											3	2
Average	3	2.5	1	3									2.5	2
Level of	3	3	1	3									3	2

Correlation														

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY(AUTONOMOUS)

I B.Tech I Semester (Common to CE, ME, ECE, CSE (AI), CSE (CS) & CSE (IOT))
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 successful completion of the course, the 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 throughRedwood viscometer No.1.
6. Estimation of Ferrous Ion by Potentiometry using standard Potassium Dichromate in a Redoxreaction.
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 bottlesand Reagent bottles.
2. Analytical balance,
3. Pensky Marten's apparatus
4. Redwood viscometer,
5. Conductometer,
6. Potentiometer.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**												
CO2	**3**	**2**												
CO3	**3**	**3**												
Average	**3**	**2.67**												
Level of correlation	**3**	**3**												

3-High Mapping 2- Medium Mapping 1-Low Mapping

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 STRUCTURES 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. Apply the concepts Stacks and Queues using C Programming.
4. Illustrate 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 linkedlist.

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 thefollowing 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 ofintegers 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 ApproachUsing C", Third edition, CENGAGE Learning, 2016.
3. Richard F. Gilberg & Behrouz A. Forouzan, "Data Structures: A Pseudocode Approach withC", 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.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2		3								3	2
CO2	3	3	3	3	3				2				3	3
CO3	3	3	1	2	3								3	3
CO4	3	2	2		2								3	2
CO5	3	3	3	2	3						2		3	2
Average	3	2.8	2.2	2.33	2.8				2		2		3	2.4
Level of Correlation	3	3	2	3	3				2		2		3	3

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

I B.Tech I Semester (Common to CE, ME, ECE, CSE (AI), CSE (CS) & CSE (IOT))
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 successful completion of the course, the student 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.

Mapping :

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

CO3	**2**	**2**								**3**		**2**		
CO4	**3**									**3**		**2**		
Average	**2.75**	**2.33**							**3**	**3**		**2**		
Level of correlation	**3**	**2**							**3**	**3**		**2**		

3-High Mapping 2- Medium Mapping 1-Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
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20AMB01: DESIGN THINKING
(Mandatory course)

L	T	P	C
2	0	0	0

COURSE OUTCOMES:

After completion of the course the student will be able to

1. Explain design thinking concepts and models to be used to perform human centered design (Understanding).
2. Apply design thinking tools techniques to produce good design (Applying).
3. Develop innovative products or services for a customer (Creating).
4. Build prototypes for complex problems using gathered user requirements (Creating).

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",TataMc 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 Essentialsfrom 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/

Mapping :

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	3											
CO2		2	3								3			
CO3			3											
CO4			3	2										
Average		2	3	2										
Level of correlation of the course		2	3	2							3			

3- High mapping **2-Medium Mapping** **1- Low Mapping**

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,CSE (IOT),CSE (AI),CSE (CS))

L T P C
1 0 4 3

20AME01 :COMPUTER AIDED ENGINEERING DRAWING

Course Outcomess:

After completion of this course, the student will be able t

1. Communicate his/her ideas effectively by using Auto CAD software.
2. Project the points,lines,planes,solids with digital environment
3. Represent sectional views of solids and develop the sectioned object surfaces.
4. Communicate his/her ideas effectively by using Orthographic Projections and Isometric Views using computer software.

UNIT:I **10 Hrs**

Geometrical constructions of polygons (in scribing, circum scribing), special methods circle-tangents, Conics-ellipse, parabola, hyperbola -properties of conics, special methods of construction.

UNIT:II **10 Hrs**

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

UNIT:III **10 Hrs**

Projections of planes inclined to both the principal planes.

Projection of regular solids prisms, Pyramids, cylinders, tetrahedron and cones axis inclined to one plane.

UNIT:IV **10 Hrs**

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 **10 Hrs**

Principles of isometric projection is o metric 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.

Sketching of Tangents to the circles

2.Conics:

Constructions of Ellipse, Parabola ,Hyperbola

3.Points:

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

4.Lines:

Sketching of lines when they are

1.Parallel to both H.P & V.P

2.Parallel to V.P/H.P and perpendicular to H.P/V.P

3.Parallel toV.P/H.P and inclined to H.P/V.P

4.Inclined to both the planes

a) Sketching of the line to measure true length & true inclinations

b) Sketching of the line to determine the traces

5 Planes:

Sketching of the planes when they are

a) Perpendicular to V.P/H.Pandparallel 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 bothV.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 axisis

i. Perpendicular to V.P/H.P and parallel toH.P/V.P.

ii. Inclined to V.P/H.P and parallel toH.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 planeis

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, lateraledge.

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 Book(s)

1. K. L. Narayana and S. Bheemanjaneyulu, Engineering Drawing with Auto CAD 2016 ,New Age Publishers, NewDelhi,2017

2 Basant Agrawal and C.M.Agrawal, Engineering Drawing, McGraw Hill Education 2nd edition.

Reference Books

1 K.Venugopal, Engineering Drawing and Graphics+Auto Cad, New Age International (P)Ltd, Publishers , New Delhi, Fourth Edition

2 Siddiquee Arshad. N., Zahid A. Khan, Mukhtar Ahmad, Engineering Drawing: Withprimeron AUTO CAD, PHI Learning Pvt. Ltd.,

Mapping :

	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					
CO3	3	3			3				3					
CO4	3	3			3				3	3				
Average	3	3			3				3	1.5				
Level of correlation	3	3			3				3	2				

3-High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & 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, CSE (AI), CSE (CS) & CSE (IOT))

L	T	P	C
3	0	0	3

20AHS04: ENGINEERING PHYSICS

Course Outcomes:

After successful 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 **9 Hrs**

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 **9 Hrs**

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 **9 Hrs**

PRINCIPLE OF QUANTUM MECHANICS: Wave and particles - de Broglie hypotheses - de Broglie's wavelength for electron - Properties of Matter waves -Schrödinger time independent waveequation - 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 **9 Hrs**

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 **9 Hrs**

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 .

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**		**1**										
CO2	**3**	**2**				7	8							
CO3	**3**	**2**		**1**										
CO4	**2**			**2**	**1**									
Average	**2.75**	**2**		**1.33**	**1**									
Level of correlation	**3**	**2**		**1**	**1**									

(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 successful completion of the course, the student will be able to

1. Solve the system of linear equations and determine the eigen values and eigen vectors.
2. Apply the Laplace transform techniques to solve ordinary differential equations.
3. Apply Fourier series to expand periodic and elementary functions.
4. Evaluate Fourier sin and cosine transforms for given functions.
5. Analyze the principles of Z-transforms for solving the difference equation.

UNIT-I **10 Hrs**

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

UNIT-II **10 Hrs**

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 **10 Hrs**

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

UNIT-IV **10 Hrs**

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 **10 Hrs**

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 andothers, 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.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**												
CO2	**3**	**2**		**2**										
CO3	**3**	**2**												
CO4	**3**	**2**												
CO5	**3**	**2**												
Average	**3**	**2**		**2**										
Level of correlation	**3**	**2**		**2**										

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

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", McGraw,Hillpublications
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.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PS02
CO1	**1**	**2**			**3**			**1**			**1**			
CO2	**1**	**2**			**3**			**1**						
CO3	**1**				**2**			**1**						
CO4	**1**	**1**			**1**			**2**			**1**			
Average	**1**	**2**			**3**			**2**			**1**			
Level of Correlation of the Course	**1**	**2**			**3**			**1**			**1**			

3- High Mapping **2- Medium Mapping** **1-Low Mapping**

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

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 9 hrs

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 10 hrs

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 10 hrs

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 returnstatement, Recursive function, Lambda Function**. Files** – File Handling, Create, Write, Read and Delete Files

UNIT-IV 9 hrs

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 8 hrs

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.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3												2	
CO2	3	2												
CO3	3	3	3	3	2								3	2
CO4	3	3	1	1									3	2
CO5	3	3	3	3	3								3	3
Average	3	2.75	2.33	2.33	2.5								2.75	2.33

Level of Correlation	**3**	**3**	**3**	**3**	**3**								**3**	**3**

3- High mapping **2-Medium Mapping** **1- Low Mapping**

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,CSE (IOT),CSE (AI),CSE (CS))

20AME02: Engineering Practice lab

L	T	P	C
0	0	3	1.5

Course Outcomes:

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

1. Perform a different prototype models in the carpentry trade such as Mortise and tenonjoint, and Table stand usingwood turning lathe.
2. Prepare models such as Dove tail joint and Half Round joint using Fitting tools and rectangulartray,and funnel prototypes in the trade of Tinsmithy.
3. Perform various basic House Wiring techniques such Staircase wiring (i.e. control of onelamp by two switches fixed at two different places), and wiring for tube light (Fluorescent Lamp)/Focus light.
4. Fabricate different models in a foundry shop such as single and two pieces pattrens and prototypes in the trade of Welding suchasT-JointandH-Joint.

TRADES FOR EXERCISES:

a. Carpentryshop.

1. Preparea Mortise and tenonjoint from a given 300 x 40 x 25mm soft wood stock.
2. Preparea Table stand (desiredshape) by using wood turning Lathe from a given 300x 40x25mm soft wood stock.

b. Fittingshop

1. Preparea Dovetail joint from a given100x50x5mmM.S.stock.
2. Preparea Half Round joint from a given100x50x5mmM.S.stock.

c. Sheetmetalshop

1. PrepareaFunnelfromgivenG.I.sheet.
2. Preparea Rectangular Tray from given G.I.sheet.

d. House-wiring

1. Stair case wiring (i.e.control of one lampby two switches fixed attwo different places).
2. Prepare a wiring for tube light (‘’Fluorescent Lamp ‘’)/ Focus light

3. Preparea mould for a single piecepattern (Connectingrod)
4. Preparea mould for a Double piecepattern(SteppedPulley)

e. Welding

1. Preparea T-Joint from given M.SFlat pates using Arc Welding.
2. Preparea H-Joint from given M.SFlat pate susing Arc Welding.

2. TRADES FOR DEMONSTRATION:

a) Plumbing
b) MachineShop
c) MetalCutting

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

Reference Books

1 Work shop Manual/P.Kannaiah/K.L.Narayana/SciTechPublishers.
2 Engineering Practices Lab Manual,Jeyapoovan ,Saravana Pandian,4/eVika0073
3 Dictionary of Mechanical Engineering,GHF Nayler,Jaico Publishing House.
4 Engineering Work shopby Vishnu UniversalLearning.
5 Engineering Work shop by GRI Einstitute.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**			**3**				**3**					
CO2	**3**	**2**			**3**		7	8	**3**					
CO3	**3**	**2**			**3**				**3**					
CO4	**3**	**2**			**3**				**3**					
Average	**3**	**2**			**3**				**3**					
Level of correlation	**3**	**2**			**3**				**3**					

3- High mapping **2-Medium Mapping** **1- Low Mapping**

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: ononononon

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 recursivefunctions.

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 inthe file in alphabetical order

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

WEEK 12

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

b. Write a program to compute summary statistics such as mean, median, mode, standarddeviation 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.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	3								3	3
CO2	3	3											3	1
CO3	3	3	3	3	3								3	3
CO4	3	3											3	2
Average	3	3	3	2.5	3								3	2.25
Level of Correlation	3	3	3	3	3								3	2

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

I 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, CSE (AI), CSE (CS) & CSE (IOT))

L	T	P	C
0	0	3	1.5

20AHS07 : ENGINEERING PHYSICS LAB

Course Outcomes:

After completion of practical, student will be able to

1. Explore the knowledge of Spectrometer and other optical instruments.
2. Apply concepts of magnetic materials, lasers, semiconductor, and it's their relative parameters.
3. Access, process and analyse scientific information of optical communication.

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.

Mapping :

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

Average	**2.67**	**1**			**2**									
Level of correlation	**3**	**1**			**2**									

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND 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, CSE (AI), CSE (CS) & CSE (IOT))

L	**T**	**P**	**C**
2	**0**	**0**	**0**

20AHS09: ENVIRONMENTAL SCIENCES

(Mandatory Course)

Course Outcomes:

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

1. Aware of the complex relationships between environment and human system.
2. Develop critical thinking (or) observation skills and apply them in the analysis of a problem (or) question related to the environment.
3. Identify the major pollutants and abatement devices in order to protect the environment from pollution for effective environmental management.
4. Analyze and interpret the fundamental physical, chemical, biological principles and social factors that govern natural process.

UNIT-I **5 Hrs**

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, speciesand 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 **5 Hrs**

NATURAL RESOURCES:

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 - Role of an individual in conservation of natural resources - Equitable use of resources for sustainable life styles.

UNIT-III **5 Hrs**

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 **5 Hrs**

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 **3 Hrs**

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.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PS02
CO1	2						3							
CO2	2						3							
CO3	2						3							
CO4	2						3							
Average	2						3							
Level of correlation	2						3							

3-High Mapping 2- Medium Mapping 1-Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

Course Outcomes:

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

20AHS10:
NUMERICAL METHODS

L	T	P	C
3	-	-	3

After successful 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 multistep methods.
5. Solve real world problems using solutions of partial differential equations.

UNIT-I **10 Hrs**

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: Introduction–Inter mediate value theorem-The Bisection method-The method of false position Newton - Raphson 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 **8 Hrs**

NUMERICAL DIFFERENTIATION AND INTEGRATION: Approximation of derivatives using interpolation polynomials-First and second order derivatives-Problems on numerical differentiation. Newton Cotes formulae – Numerical integration using Trapezoidal rule, Simpson's 1/3 rule and Simpson's 3/8 Rule.

UNIT-III **10 Hrs**

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 **8 Hrs**

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-V 9 Hrs

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

TEXT BOOKS:

1. Dr. B. S. GREWAL, Higher Engineering Mathematics. Kanna Publications, 42th edition.
2. B.V. Ramana, A Text Book of Engineering Mathematics-I, TATA MCGRAWHILL
3. E. Rukmangadachari and Keshava Reddy, 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 ageInternational 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 Hall of India publications, 2011

Mapping:

CO/POS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO10	PO11	PO 12	PSO1	PSO2
CO1	3	3												
CO2	3	3												
CO3	3	2												
CO4	3	2												
CO5	3	2												
Average	3	2.4												
Level of corelation	3	2												

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)

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

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 problemscomplying 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, anddesign 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-interruptoverhead- 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, McGrawHill, New Delhi,India,2010.

REFERENCE BOOKS:

1. William Stallings, Computer Organization and Architecture, designing for performance, 8 thedition, 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.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3												3	
CO2	3	3	1	3									3	2
CO3	3	3		1									3	2
CO4	3	2	1										3	2
CO5	3	2											2	
Average	3	2.5	1	2									2.8	2
Level of Correlation	3	3	1	2									3	2

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

L	T	P	C
3	-	-	3

20AIT01:AUTOMATA & COMPILER DESIGN

Course Outcomes:

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

1. Demonstrate knowledge to represent the different programming language constructs in the machine understandable language by using the basic tools 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 **7 Hrs**

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 **8 Hrs**

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 **10 Hrs**

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 **8 Hrs**

INTERMEDIATE CODE GENERATION

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

UNIT-V **9 Hrs**

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.

TEXTBOOKS:

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

REFERENCEBOOKS:

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.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**2**	**1**	**1**										**3**	**2**
CO2	**3**	**2**	**3**										**1**	
CO3	**2**		**2**										**3**	1
Average	**2.33**	**1.5**	**1.5**										**1.67**	**1.5**
Level of Correlation	**3**	**2**	**2**										**2**	**2**

3- High mapping **2-Medium Mapping** **1- Low Mapping**

(AUTONOMOUS)

II B.Tech I Semester (Common to CSE, IT, CSD, CSM,CSE (CS))
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.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**											**3**	
CO2	**3**	**3**	**3**	**2**	**3**								**3**	**3**
CO3	**3**	**3**	**3**	**2**	2								**3**	**3**
CO4	**3**	**3**											**3**	**3**
Average	**3**	**3**	**3**	**2**	**2.5**								**3**	**3**
Level of Correlation	**3**	**3**	**3**	**2**	**3**								**3**	**3**

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
II B.Tech I Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML)(CS))
III B.Tech I Semester EEE, ECE (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 andblock statements. Arrays-one dimensional, two dimensional, String class, StringBuffer class, StringBuilder.

UNIT –II **8 Hrs**

Fundamentals, declaring objects, object REFERENCEBOOKS, 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 **9 Hrs**

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, interthread 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.

TEXTBOOKS:

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.

REFERENCEBOOKS:

1. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, PearsonEducation.
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.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3												3	
CO2	3	3	2	1	2								3	2
CO3	3	3	3	3	2								3	2
CO4	3	3	2	3	2								3	
CO5	2	3	1	3										1
Average	2.8	3	2	2.5	2								3	1.66
Level of Correlation	3	3	2	3	2								3	2

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

L	T	P	C
-	-	3	1.5

20ACS09:OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

Course Outcomes:

After completion of course 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 Hacker Rank and Hacker Earth Example: Hacker Earth –jumble letter, missing alphabets Hacker Rank -bear and steady gene, super reduced string, gemstones

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	3				1				3	3	3
CO2	3	3	3	3	2								3	2	1
CO3	3	3	3	3					3				1	1	1
Average	3	3	2.67	2.67	2.5				2				2.33	2	
Level of Correlation	3	3	3	3	3				2				3	2	

***3*- High mapping** **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

L	T	P	C
-	-	3	1.5

20ACS10 - RELATIONAL DATABASE MANAGEMENT SYSTEMS LAB

Course Outcomes:

At the end of the course 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 realisticproblems.
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 whosecured 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) ImplementCOMMIT, 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 ofPROCEDURES.

9. Program development using the creation of stored functions, invoke functions in SQL Statementsand 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.

Mapping:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	**3**	**3**	**3**	**2**	**2**				1				**3**	**1**
CO2	**3**	**3**	3	2	**3**								**3**	1
CO3	**3**	**3**	**3**	**2**	2							1	**3**	**3**
CO4	**3**	**3**		1	**3**								**3**	**1**
Average	**3**	**3**	**3**	**1.75**	**2.5**				**1**			**1**	**3**	**1.5**
Level of Correlation	**3**	**3**	**3**	**2**	**3**				**1**			**1**	**3**	**2**

3- High mapping **2-Medium Mapping** **1- Low Mapping**

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**

1.520AIT02 - AUTOMATA AND COMPILER DESIGN LAB

Course Outcomes:

At the end of the course 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 ofletters 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, 2nd 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.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**											**3**	**1**
CO2	**3**	**3**			**2**								**2**	
CO3	**3**												**2**	
CO4	**3**				**2**								**2**	
AVG	**3**	**2.5**			**2**								**2.25**	**1**
LOC	**3**	**3**			**2**								**2**	**1**

4- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

II B.Tech I Semester CSE (CS)

L	T	P	C
-	-	3	1.5

20ACC01: SHELL SCRIPTING WITH LINUX

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

CO1. Demonstrate knowledge on

- Basic commands
- Program arguments
- Environment Variables

CO2. Design interactive shell scripts related to Linux Environment for solving specified computational problems.

CO3. Analyze system calls related to standard I/O library, formatted input, output, file and directory maintenance.

CO4. Apply the system calls for process management and signal handling.

Apply inter process communication and socket programming for developing client - server applications.

LIST OF EXPERIMENTS:

Linux boot process concepts and kernel modules

1. Implement the following activities:
a) Installation of Unix/Linux Operating systems
b) Study of logging and logout details

2. Study and Execute of Unix/Linux general purpose utility command list
Cal, script ,date,who,tty, clear, cat, echo,printf, uname,du,df,wc ,mkdir, rmdir, cp, mv,rm, ,chmod,chown.

3. Study and Execute of Unix/Linux general purpose utility command list
Create two files source.txt and dest.txt using vi editor which contains some text and practice the following commands on that files head , tail, sort, cut, paste, join, tee ,nl, uniq,

Exercise 4a. Write a shell script to list all of the directory files in a directory.

4b. Write a shell script to find factorial of a given integer

Exercise 5a.write a shell script to display multiplication table of the given number

5b. write a shell script to copy source file to destination file

Exercise: 6: Create two files source.txt and dest.txt using vi editor which contains some text and practice the following SED command in unix supports regular expression which allows it perform complex pattern matching

1. Replacing or substituting string

2. Replacing the nth occurrence of a pattern in a line
3. Replacing all the occurrence of the pattern in a line :
4. Replacing from nth occurrence to all occurrences in a line :
5. Replacing string on a specific line number :
6. Duplicating the replaced line with /p flag :
7. Printing only the replaced lines :

Exercise 7a. write a program to count number of lines,words,characters in a given file

7b write a shell script to calculation of simple interest

Exercise 8a Write a shell script that displays a list of all files in the current directory to which the user has read, write and execute permissions.

b. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or directory and reports accordingly. Whenever the argument is a file it reports no of lines present in it

Exercise 9 : Write a C program to create child process and allow parent process to display “parent” and the child to display “child” on the screen.

Exercise 10 : Write a shell script that computes the gross salary of a employee according to the

following rules:

i)If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic.

ii)If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic.

The basic salary is entered interactively through the key board.

Text Book:

1. Sumitabha Das, "Your Unix The Ultimate Guide", Tata McGraw Hill, 2007.

Reference Books:

1. B.A. Forouzan & R.F. Giberg, "Unix and Shell Programming," Thomson Learning 2003.

2. Richard Stevens, "Advanced UNIX Programming", 2ed, Pearson Education 2004.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

II B.Tech – I Semester

(Common to CE, EEE, ME, ECE, CSE, IT, CSE (DS) ,CSE(AI &ML) ,CSE (AI) , CSE (CS) &CSE (IOT))

L	T	P	C
2	-	-	-

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 withresponsibility.
2. Analyse the elements of sentient 'I' and material human body to design a living withresponsibility for happiness and prosperity.
3. Apply the principles of 'trust' and 'respect' for designing a society with universal humanorder.
4. Analyse the situations causing imbalance in nature and further design an ecosystem forpeaceful co-existence.
5. Apply the principles of science technology and management to solve contemporaryproblems professionally and ethically.

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

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 Happinessand Prosperity correctly- A critical appraisal of the current scenario; Method to fulfil the above human aspirations: understanding and living in harmony at various levels.

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; Understandingthe 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 anddifferentiation; 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 fourorders 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 atall levels of existence

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- friendlyproduction 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 and organizations.

Textbooks:

1. R R Gaur, R Asthana, G P Bagaria, "A Foundation Course in Human Values and Professional Ethics", 2nd 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", 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN978-93-87034-53-2.

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).

Mapping :

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	3	3	3	2	-	-	-		
CO2	-	-	-	-	-	3	3	3	2	-	-	-		
CO3	-	-	-	-	-	3	3	3	2	-	-	-		
CO4	-	-	-	-	-	3	3	3	2	-	-	-		
CO5	-	-	-	-	-	3	3	3	-	-	-	-		
Average	-	-	-	-	-	3	3	3	2	-	-	-		
Level of correlation of the course	-	-	-	-	-	3	3	3	2	-	-	-		

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

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

L	T	P	C
2	0	0	0

20AHS11 QUANTITATIVE APTITUDE AND REASONING-I

Course Outcomes:

After successful 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 **9 Hrs**

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-II **9 Hrs**

QUANTITATIVE ABILITY – II: Arithmetic Progression – Common Difference- n^{th} Term – Sum of terms – Geometric Progression – Common Ratio – n^{th} term – Sum of Terms – Averages - Weighted average – Percentages – Conversion – Increasing and decreasing in quantity – Change in Percentage – Successive discount
– Compound Growth

UNIT-III **9 Hrs**

REASONING ABILITY I: Coding and Decoding – Blood Relations – Directions – Number Series and Letter Series – Ranking and Ordering

UNIT-IV **9 Hrs**

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 Timeand Prepo

UNIT-V **9 Hrs**

SOFT SKILL I: Communication Skills - Self-Confidence - Introductions & Greetings - Presentation Skills - Self- Motivation

Text Books:

1. Quantitative Aptitude, Logic Reasoning & Verbal Reasoning, R S Agarwal, S.ChandPublications.
2. Quantitative Aptitude for Competitive Examinations, R S Agarwal, S.Chand Publications

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2												
CO2	2	2								2				
CO3	2									2				
Average	2.33	2								2				
Level of correlation	2	2								2				

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OFENGINEERING & TECHNOLOGY (AUTONOMOUS)

II B. Tech - II Semester (Common to CE, ME, CSE, CSE (AI&ML) CSE (CS),& IT)

L	T	P	C
3	1	0	3

20AHS13 PROBABILITY AND STATISTICS

Course Outcomes:

After successful 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 11 Hrs

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 9 Hrs

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 8 Hrs

TEST OF HYPOTHESIS: Null Hypothesis-Alternative Hypothesis-Critical region – Level of Significance-TypeI 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 9 Hrs

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-squaretest for goodness of fit and test for attributes.

ANALYSIS OF VARIANCE – One way and Two way Classifications

UNIT-V **8 Hrs**

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, PearsonEducation, 2014.
2. S. P. Gupta, Statistical Methods,33rd Edition, publications Sultan Chand& 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.

Mapping:

CO/POS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	3	3												
CO2	3	3		1										
CO3	3	2												
CO4	3	2												
Aveerage	3	2.5		1										
Level of correlation	3	3		1										

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

2. Apply lattice theory and Boolean algebra in theory and design of computers.

3. Apply generating functions to solve the combinatorial problems which makes easier tosolve broad spectrum of problems.

4. Apply the graph theory and trees in describing structures involving hierarchy. Also used in switching and logical design.

UNIT-I: 9 Hrs

MATHEMATICAL LOGIC AND PREDICATES: Statements and notations, Connectives, Well -formed formulas, Truth Tables, tautology, equivalence implication, Normal forms.

Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof by contradiction.

UNIT-II: 9 Hrs

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 to Boolean Algebra- SubAlgebra, Direct product and homomorphism.

UNIT-III: 9 Hrs

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

UNIT- IV: 9 Hrs

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: **9 Hrs**

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 Euler 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.

Reference Books:

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.

Mapping:

CO/POS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO10	PO11	PO1 2	PSO1	PSO2
CO1	**3**	**3**												
CO2	**3**	**3**		**1**										
CO3	**3**	**2**												
CO4	**3**	**2**												
Average	**3**	**2.5**		**1**										
Level of correlation	**3**	**3**		**1**										

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

II B.Tech, II Semester -CSE(CS)	**L**	**T**	**P**	**C**
	3	**-**	**-**	**3**

20ACC02: ESSENTIALS OF CYBER SECURITY

Course Outcomes:

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

1. Understanding the fundamental concepts of cyber security concepts.
2. Identify the pattern of launching attacker and fraud techniques and supporting threat infrastructure.
3. Identify the vulnerabilities using the SQL injection and web exploitation techniques in a system for securing data.
4. Apply persistent software techniques by the attacker to access privileged user accounts in a virtual machine.
5. Apply honey pots and malicious code-naming techniques to defend against attacks in memory.

UNIT I: Cyber Security Fundamentals (10 Hrs)

Network Security Concepts: Information assurance fundamentals, Basic cryptography, Symmetric encryption, Public key encryption, The Domain Name System (DNS), Firewalls, Virtualization, and Radio-Frequency Identification.

UNIT II: Attacker techniques (08 Hrs)

Attacker techniques and motivations: Anti forensics, proxy usage, tunneling techniques: HTTP, DNS, ICMP, Intermediaries, Steganography and other concepts, Detection and prevention.

Fraud techniques: Phishing, smishing, vishing and mobile malicious code, rogue antivirus, click fraud.

Threat infrastructure: Botnets, Fast Flux, Advanced Fast Flux.

UNIT III: Exploitation (10 Hrs)

Shellcode, Integer overflow vulnerabilities, Stack based buffer overflows, Format string vulnerabilities, SQL injection, Malicious PDF files, Race conditions, Web exploit tools, DoS conditions, Brute force and dictionary attacks.

UNIT IV: Malicious code (10 Hrs)

Worms, viruses, Evading detection and elevating privileges: obfuscation, Virtual Machine obfuscation Persistent software techniques, Token kidnapping, Virtual machine Detection, Rootkits, Spyware, Attacks against privileged user accounts and escalation of privileges, Stealing information and Exploitation.

UNIT V: Defense and analysis techniques (10 Hrs)

Importance of memory forensics, Capabilities of memory forensics, Memory analysis frameworks, Dumping physical memory, Installing and using volatility, finding hidden processes, Volatality analyst pack.

Honeypots, Malicious code naming, automated malicious code analysis systems, Intrusion detection techniques.

TEXT BOOKS:

1. James Graham, Richard Howard, Ryan Olson, " Cyber Security Essentials", CRC Press, 2011.
2. Chwan-Hwa(john) Wu,J. David Irwin, "Introduction to Cyber Security", CRC Press T&F Group.

REFERENCE BOOKS:

1. Nina Godbole and SunitBelpure, "Cyber Security Understanding Cyber Crimes,Computer Forensics and Legal Perspectives" , Wiley publications.
2. B.B.Gupta, D.P.Agrawal, HaoxiangWang, "Computer and Cyber Security: Principle s, Algorithm, Applications, and Perspectives", CRC Press, ISBN 9780815371335, 2018.

ADDITIONAL LEARNING RESOURCES:

1. https://www.digimat.in/nptel/courses/video/106106199/L41.html
2. https://www.digimat.in/nptel/courses/video/106105031/L01.html

CO-PO and PSO Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO2	3	3	1	2	1	-	-	-	-	-	-	-	3	-	-
CO3	2	3		1	2	1	-	-	-	-	-	-	3	-	-
CO4	3	2	1	2	1	1	-	-	-	-	-	-	3	-	-
CO5	3	2	1	2	1	1	-	-	-	-	-	-	3	-	-
Average	2.8	2.5	1	1.7	1.25	1	-	-	-	-	-	-	3	-	-
Level of correlation of the course	3	3	1	2	1	1	-	-	-	-	-	-	3	-	-

Level of Correlation: 3-High 2- Medium 1- Low

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

II B.Tech II Semester (Common to CSE, IT, CSD, CSM,CSE (CS),CSE (AI),CSE (IOT))

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 **8 hrs**

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 **8 hrs**

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 **8 hrs**

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 7 hrs

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 8 hrs

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).

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	1
CO3	3	2	1										3	2
CO4	3	2											3	2
Average	3	2.25	1.33	3	1								3	2
Level of Correlation	3	2	1	3	1								3	2

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)

II B.Tech II Semester (Common to CSE, IT, CSD,CSE (CS))
III B.Tech I Semester CSE (AI & ML)-PE-I

L	T	P	C
3	-	-	3

20ACS12: DESIGN & ANALYSIS OF ALGORITHMS

Course Outcomes

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 **8 hrs**

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 ` **9 hrs**

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 **8 hrs**

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 7 hrs

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 8 hrs

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 ComputerAlgorithms, 2nd Edition, Universities Press, 2008.
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction toAlgorithms,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 BhalachandraDave, 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.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2									3	2
CO2	3	3	3	2									3	2
CO3	3	3	3	1									3	1
CO4	3	3	1	2									3	2
Average	3	3	2.25	1.75									3	1.75
Level of Correlation	3	3	2	2									3	2

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

II B.Tech II Semester -CSE (CS)

L	T	P	C
-	-	3	1.5

20ACC03: ESSENTIALS OF CYBER SECURITY LAB

COURSE OUTCOMES: *On successful completion of this course, the students will be able to*:

1. Analyze key features on providing firewalls and security to network.
2. Simulate and analyze different techniques for launching attacks in networks.
3. Select and apply tools like snort, Bro for performing traffic analysis on IP network.
4. Work independently or in team to solve problems with effective communication.

LIST OF EXPERIMENTS:

1. Implement RSA Asymmetric cryptographic algorithm for demonstrating values for Private and Public Keys in cryptographic systems.
2. Analyze the features of firewall in providing network security in windows.
3. Implement Firewall Configuration and generate Assessment-iptables using command arguments.
4. Explore various network connections in real world environments and create SSH tunneling connection.
5. Write a program to Demonstrate DNS Message format for resolver library routines.
6. Simulate buffer overflow attack and protect against SQL injection attack.
7. Implement Brute force and dictionary attacks to generate passwords and hashes for files created in system.
8. Installation and working of Intrusion detection System (IDS) using snort tool.
9. Install antivirus software to implement prevention mechanisms to avoid viruses and other malwares.
10. i. Threat & Vulnerability Management Module - Identify how attackers are developing their techniques to use in your defensive strategy.

ii. Malware Analysis Module - Analyze malicious files to prevent malicious actions and identify attacks.

TEXT BOOKS:

1. James Graham, Richard Howard, Ryan Olson, "Cyber Security Essentials", CRC Press, 2011.

REFERENCE BOOKS:

1. Chwan-Hwa (john) Wu, J. David Irwin, "Introduction to Cyber Security", CRC Press T&F Group.
2. Nina Godbole and SunitBelpure, "Cyber Security Understanding Cyber Crimes,Computer Forensics and Legal Perspectives" , Wiley publications.

3. B. B. Gupta, D.P. Agrawal, HaoxiangWang, “Computer and Cyber Security: Principles, Algorithm, Applications, and Perspectives”, CRC Press, ISBN 9780815371335, 2018.

Software/tool used:
Turbo c++/Devc++, Snort, Bro, Sophos etc.

Mapping Table:

	PO1	***PO2***	***PO3***	***PO4***	***PO5***	***PO6***	***PO7***	***PO8***	***PO9***	***PO10***	***PO11***	***PO12***	***PSO1***	***PSO2***	***PSO3***
CO1	3	3	-	1	-	-	-	-	-	-	-	-	3	-	-
CO2	3	3	-	1		-	-	-	-	-	-	-	3	-	-
CO3	3	3	-	1	2	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	-	3	3	-	-	3	-	-
Average	3	3	-	1	2	-	-	-	3	3	-	-	3	-	-
Level of correlation of course	**3**	**3**	-	1	2	-	-	-	-	-	-	-	3	-	-

Level of Correlation: **3-High** **2- Medium** **1- Low**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

II B.Tech II Semester (Common to CSE, IT, CSD,CSM,CSE (CS),CSE (AI),CSE (IOT))

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. Design the principles of CPU scheduling concepts.
3. Design and symbolize 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)CSE (CS)AN

Mapping :

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

CO2	**3**	**3**	**3**	**2**									**3**	**2**
CO3	**3**	**2**	**3**	**2**									**3**	**2**
CO4	**3**	**2**	**3**	**2**									**3**	**1**
CO5	**3**	**2**	**3**	**2**									**3**	**2**
Average	**3**	**2.2**	**2.6**	**2.25**	**3**								**3**	**2**
Level of Correlation	**3**	**2**	**3**	**2**	**3**								**3**	**2**

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

II B.Tech II Semester (Common to CSE, IT, CSD,CSE (CS))

L	T	P	C
-	-	3	1.5

20ACS14 DESIGN & ANALYSIS OF ALGORITHMS LAB

Course Outcomes:

After Completion of the course 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 as sorting, graph related, combinatorial usinghigh 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 solvereal-world problems.

LIST OF EXPERIMENTS

1. Sort a given set of elements using the Quicksort method and determine the time requiredto sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versus n. The elementscan 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 verticesusing Dijkstra's algorithm
5. Find Minimum Cost Spanning Tree of a given undirected graph using Krushkal'salgorithm.
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

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**3**	**2**									**3**	**2**
CO2	**3**	**3**	**2**	**1**	**3**								**3**	**1**
CO3	**3**	**3**	**1**	**3**									**3**	**1**
CO4	**3**	**3**	**3**	**3**									**3**	**3**
Average	**3**	**3**	**2.25**	**2.25**	**3**								**3**	**1.75**
Level of Correlation	**3**	**3**	**2**	**2**	**3**								**3**	**2**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
II B.Tech II Semester (Common to CSE, IT, CSE (DS) & CSE (AI &ML),CSE(CS))

	L	T	P	C
Code: 20ACD04	**1**	**0**	**2**	**2**

DATA ANALYTICS WITH R

Course outcomes:

1. Apply the knowledge of basic programming and execute R program using supported functionalities to solve real time applications.
2. Apply the knowledge of pre-processing techniques, to transform variables to facilitate analysis.
3. Design an effective model which enhance the prediction accuracy
4. To apply the knowledge of visualization technique to interpret the analysed data

List of Experiments

1. Experiments on various data structures available in R.

1) Write a R program to simulate functional programming of statistical parameter(mean, median and mode)
2) Simulate the concept of data cleaning using data set.
3) Simulate the concept of handling missing values with average.
4) Implement the various plotting scheme using R.
5) Bar chart (ii) Scatter plot (iii) Box plot
6) To understand and implement the concept of loop statement
7) To understand and implement the concept of vectors
8) To understand and implement the concept of various models in R
9) To understand and implement the concept of various data transformation techniques

Text Book(s)

1) Norman Matloff, The Art of R Programming: A Tour of Statistical Software Design, No Starch Press Edition: 2011
2) Garrett Grolemund, Hadley Wickham, R for Data Science, O'Relly,2016

Reference Books

1. Beginning Data Science in R: Data Analysis, Visualization, and Modelling for the DataScientist. by Thomas Mailund

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**2**	**2**	**3**										**3**	**2**
CO2	**3**	**3**	**2**	**1**	**3**								**3**	**2**
CO3	**3**	**3**	**2**	**2**									**3**	**2**
CO4	**2**	**2**	**2**										**3**	**2**
Average	**2.5**	**2.5**	**2.25**	**0.75**	**0.75**								**3**	**2**
Level of Correlation	**3**	**3**	**2**	**1**	**1**								**3**	**2**

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & 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 successful 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 **9 Hrs**

QUANTITATIVE ABILITY III: Profit, Loss and Discount – Cost Price – Selling Price – Retail Price – Markup Price – Ratio and Proportion Antecedent – Consequent - Mean Proportion –Direct variation – Indirect Variation – Joint Variation Partnership – Mixture and Allegation – Problems on Ages – Surds and Indices

UNIT-II **9 Hrs**

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 **9 Hrs**

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 **9 Hrs**

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 **9 Hrs**

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.ChandPublications.
2. Quantitative Aptitude for Competitive Examinations, R S Agarwal, S.ChandPublications.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	2													
CO2	1	2								2					
CO3	2									2					
Average	2	2								2					
Level of correlation	2	2								2					

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

II B.Tech II Semester CE,ME & ECE

II B.Tech I Semester EEE, CSE, IT, CSE(DS),CSE(AI & ML),CSE(CS),CSE(AI),CSE(IOT)

L	T	P	C
3	-	-	3

20AMB03: MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Outcomes:

After the completion of the course student will be able to

1. Explain the fundamental concepts and theoretical principles of the Economics
2. Apply economic principles for problem solving.
3. Identify market structures and types of business organizations.
4. List features, steps, merits, uses & limitations of Pay Back Period, ARR and NPV methods of Capital Budgeting
5. Explain the basic concepts of book keeping and accounting, and analyze financial statements.

UNIT –I Introduction to Managerial Economics

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 Cost Analysis

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 Business Organizations:

Market structures –Types of Competition –Features of perfect competition, Monopoly, Monopolistic competition –Price-Output Determination under perfect competition andMonopoly –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 Capital and Capital Budgeting:

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 FinancialAnalysis through Ratios:

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).

TEXTBOOKS:

1. Arya sri A. R., Managerial Economics and Financial Analysis, 4/E, TMH, 2009.
2. Varshney R.L. and K.L. Maheswari, Managerial Economics, Sultan Chand &Sons, 19/E,2009.
3. Siddiqui S.A. and Siddiqui A.S., Managerial Economics and Financial Analysis,New Age international, 2009.

REFERENCEBOOKS:

1. Gupta R.L., Financial Accounting, Volume I, Sultan Chand & Sons, New Delhi, 2001
2. James C. Van Horne, Financial Management policy, 12/E, PHI, 2001.
3. Joel Dean, Managerial Economics, PHI, 2001.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1						2					3				
CO2			2												
CO3						2					3				
CO4											3				
CO5											3				
Average			2			2					3				
Level of correlation of the course			2			2					3				

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING &TECHNOLOGY (AUTONOMOUS)

II B.Tech I Semester CSE (CS)

L	T	P	C
3	0	0	3

20ACC04: CRYPTOGRAPHY

COURSE OUTCOMES:

At the end of the course the student will be able to:
CO1: Understand the fundamentals of networks security, security architecture, threats and vulnerabilities

CO2: Apply the different cryptographic operations of symmetric cryptographic algorithms

CO3: Apply the different cryptographic operations of public key cryptography CO4: Apply the various Authentication schemes to simulate different applications. CO5: Understand various cybercrimes and cyber security.

UNIT I INTRODUCTION TO SECURITY 8 Hrs

Computer Security Concepts – The OSI Security Architecture – Security Attacks – Security Services and Mechanisms – A Model for Network Security – Fundamental Security Design Principles-Attack surfaces and Attack Trees -Classical encryption techniques: Substitution techniques, Transposition techniques, Steganography .

UNIT II SYMMETRIC CIPHERS 10 Hrs

Number theory – Algebraic Structures – Modular Arithmetic – Euclid's algorithm –Group, Rings, Fields, Finite Fields

SYMMETRIC KEY CIPHERS: SDES – Block Ciphers – DES, Strength of DES – Differential and linear cryptanalysis – Block cipher design principles – Block cipher mode of operation — Pseudorandom Number Generators – RC4 – Key distribution.

UNIT III ASYMMETRIC CRYPTOGRAPHY 9 Hrs

MATHEMATICS OF ASYMMETRIC KEY CRYPTOGRAPHY: Primes –Testing for Primality– Factorization – Euler's totient function, Fermat's and Euler's Theorem – Chinese Remainder Theorem – Exponentiation and logarithm

ASYMMETRIC KEY CIPHERS: Principles of public key cryptosystem-RSA Algorithm – Diffie Hellman key exchange -– Elliptic curve arithmetic – Elliptic curve cryptography.

UNIT IV INTEGRITY AND AUTHENTICATION ALGORITHMS 11 Hrs

Authentication requirement – Authentication function – MAC – Hash function – Security of hash function: HMAC, CMAC – SHA – Digital signatures– Elgamal Digital Signature Scheme –Schnorr Digital Signature Scheme – Authentication applications – Kerberos

MUTUAL TRUST: Key management and distribution – Symmetric key distribution using symmetric and asymmetric encryption – Distribution of public keys – X.509 Certificates.

UNIT V CYBER CRIMES AND CYBER SECURITY 8 Hrs

Cyber Crime and Information Security – classifications of Cyber Crimes – Tools and Methods – Password Cracking, Keyloggers, Spywares, SQL Injection – Attacks on Wireless Networks--Cyberstalking--Botnets

TEXT BOOKS :

1. William Stallings, "Cryptography and Network Security - Principles and Practice", Seventh Edition, Pearson Education, 2017.

2. Nina Godbole, Sunit Belapure, “Cyber Security: Understanding Cyber crimes, Computer Forensics and Legal Perspectives”, First Edition, Wiley India, 2011.

REFERENCE BOOKS:

1. Behrouz A. Ferouzan, Debdeep Mukhopadhyay, "Cryptography and Network Security", 3rd Edition, Tata Mc Graw Hill, 2015.

2. Charles Pfleeger, Shari Pfleeger, Jonathan Margulies, "Security in Computing", Fifth Edition, Prentice Hall, New Delhi, 2015.

Mapping:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PS03**
CO1	3	2	1	2	2	-	-	-	1	-	-	1	2	3	3
CO2	3	3	3	3	3	-	-	-	2	-	-	1	3	3	3
CO3	3	3	3	3	3	-	-	-	2	-	-	1	3	3	3
CO4	3	3	3	3	3	-	-	-	2	-	-	1	3	3	3
CO5	3	2	3	2	3	-	-	-	3	-	-	2	3	2	3
Average	3	2.6	2.6	2.6	2.8	-	-	-	2	-	-	1.2	2.8	2.8	**3**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

III B.Tech I Semester(Common to CSE, IT, CSE(DS), CSE(AI & ML), CSE(CS),CSE(AI) , CSE(IOT))
III B.Tech I Semester EEE(Open Elective-I)
IV B.Tech I Semester ME(Open Elective-I)

L	T	P	C
3	-	-	3

20ACS17:COMPUTER NETWORKS

Course Outcomes:

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

1. Describe various components and topologies of computer networks
2. Use the network reference model layered structure for real time applications.
3. Implement various routing protocols from different layers.
4. Design, implement and test an efficient algorithmic solution for the give problem.
5. Analyze network security mechanics and other issues in the application layer.

UNIT- I **13 Hrs**

Introduction: Uses of Computer Networks, Network Hardware, Network Topologies, Network Software, REFERENCEBOOKS Models.

The Data Link Layer: Data link Layer Design Issues, Elementary Data Link Protocols, and Sliding Window Protocols.

UNIT-II **10 Hrs**

The Medium Access Control Sublayer: Channel allocation Problem, Multiple Access Protocols, Ethernet: Classic Ethernet physical layer, Ethernet MAC Sublayer 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 Sublayer Protocol, 802.11 Frame Structure,

UNIT-III **10Hrs**

The Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Internetworking, Network Layer in the Internet.

UNIT-IV **8 Hrs**

The Transport Layer: Transport Service, Elements of Transport Protocols, Internet Transport Protocols: UDP, Internet Transport Protocols: TCP.

UNIT-V **5 Hrs**

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.

REFERENCEBOOKS:

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.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	**3**												**3**	2
C02	**3**	**3**	**2**										**3**	1
C03	**3**	**3**	**3**	**1**									**3**	2
C04	**3**	**3**	**3**	**1**									**3**	2
C05	**3**	**3**											**3**	1
Average	**3**	**3**	**2.66**	**1**									**3**	2
Level of Correlation	**3**	**3**	**2**	**1**									**3**	2

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I semester- CSE(CS) **L T P C**
3 - - 3

20ACC05 :DATA PRIVACY

(Professional Elective -I)

Course Outcomes:

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

1. Characterize basic rules, Principles for protecting privacy information.
2. Formulate data that supports useful statistical inference while minimizing the disclosure of sensitive
   Information
3. Identify the list of threats on the various types of anonymized data.
4. Classify and analyze thee methods of test data generation with privacy and utility

UNIT I: DATA PRIVACY AND IMPORTANCE **10 Hrs**

Need for Sharing Data -Methods of Protecting Data Importance of Balancing Data Privacy and Utility Disclosure Tabular Data - Micro data - Approaches to Statistical disclosure control- Ethics - principles - guidelines and regulations. Microdata : Disclosure Disclosure risk - Estimating re-identification risk - Non-Perturbative Micro data - masking-Perturbative Micro data masking - Information loss in Micro data.

UNIT II: **9 Hrs**

Static Data Anonymization on Multidimensional Data : Privacy Preserving Methods - Classification of Data in a Multidimensional Dataset - Group- - based Anonymization: k-Anonymity, I-Diversity, t-Closeness. Anonymization on Complex Data Structures : Privacy-Preserving Graph Data, Privacy-Preserving Time Series Data, Time Series Data Protection Methods, Privacy Preservation of Longitudinal Data, Privacy Preservation of Transaction Data.

UNIT III **9 Hrs**

THREATS TO ANONYMIZED DATA

Threats to Anonymized Data, Threats to Data Structures. Threats by Anonymization Techniques: Randomization, k-Anonymization, I-Diversity, t-Closeness.

UNIT IV **10 Hrs**

DYNAMIC DATA PROTECTION

Dynamic Data Protection: Tokenization. Understanding Tokenization, Use Cases for Dynamic Data Protection, Benefits of Tokenization Compared to Other Methods, Components for Tokenization.

UNIT V **6 Hrs**

Privacy-Preserving Test Data Generation and Privacy Regulations Test Data Fundamentals Insufficiencies of Anonymized Test Data. Privacy regulations: UK

TEXTBOOK:

1. NatarajVenkataramanan, AshwinShriram, Data Privacy: Principles and Practice, 2016, 1st Edition, Taylor & Francis. (ISBN No.: 978-1-49-872104-2), United Kingdom.

REFERENCE BOOKS:

1. AncoHundepool, Josep Domingo-Ferrer, Luisa Franconi, Sarah Giessing, Eric Schulte Nordholt, Keith Spicer, Peter-Paul de Wolf, Statistical Disclosure Control, 2012, 1st Edition Wiley. (ISBN No.: 978-1-11-997815-2), United States.

2. George T. Duncan. Mark Elliot, Juan-Jose Salazar-Gonzalez, Statistical Confidentiality: Principle and Practice. 2011, 1st Edition, Springer. (ISBN No.: 978-1-44-197801-1).

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C01	**3**												**2**	2	3
C02	**3**	**3**	**2**										**3**	1	2
C03	**3**	**3**	**3**	**1**									**3**	2	2
C04	**3**	**3**	**3**	**1**									**3**	2	3
Average	**3**	**3**	**2.66**	**1**									**3**	2	2.5
Level of Correlation	**3**	**3**	**2**	**1**									**3**	2	3

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester- CSE(CS)

L	T	P	C
3	-	-	3

20ACC06:WIRELESS NETWORK SECURITY
(Professional Elective -I)

Course Outcomes:

After completion of the course, student will be able to

1. Explain the History of wireless Technologies and Rogue Network Access Points
2. Demonstrate the wireless LAN Security Protocols and SSL/TLS
3. Describe the concepts of FDMA,GSM Security and Algorithm Analysis
4. Explain Current and Future Technologies and Standards
5. Identify the Basic specifications in Bluetooth Security.

UNIT-I: INTRODUCTION TO WIRELESS 9 Hrs

History of Wireless Technologies, History of Wireless Security, State of the Wireless Security Industry, **Wireless Threats:** Uncontrolled Terrain, Communications Jamming, DoS Jamming, Injections and Modifications of Data, Man-in-the-Middle (MITM) Attack, Rogue Client, Rogue Network Access Points, Attacker Equipment, Covert Wireless Channels, Roaming Issues, Cryptographic Threats

UNIT-II:

INTRODUCTION TO WIRELESS SECURITY PROTOCOLS AND CRYPTOGRAPHY 9 Hrs

OSI Model, OSI Simplified, Internet Model, Wireless LAN Security Protocols, Cryptography, SSL/TLS, Secure Shell Protocols, Terminal Access and File Transfer, Port Forwarding a Word of Caution, Man-in-the-Middle of SSL/TLS and SSH, WTLS, WEP,802.1x, IP Security. **Security Considerations to Wireless Devices:** Wireless Device Security Issues, Physical Security, Information Leakage, Device Security Features, Application Security, Detailed Device Analysis, Laptops, Personal Digital Assistants (PDAS), Wireless Infrastructure

UNIT-III: WIRELESS TECHNOLOGIES AND APPLICATIONS 9 Hrs

Introduction to Cellular Networks- FDMA,TDMA, CDMA, Spread Spectrum Primer, Analogy, TDMA Vs CDMA, PDC, Security Threats,GSM Security, GSM Algorithm Analysis. **Introduction to Wireless Data Networks:** CellularDigital Packet Data (CDPD), CDPD Architecture, CDPD Security, Mobitex-MobitexArchitecture, Mobitex Security Architecture, General Packet Radio Service (GPRS)-GPRSArchitecture, Security Issues, Introduction to the Wireless Appliscation Protocol (WAP)-WAPDevice, Gateway, Security Model

UNIT-IV: WIRELESS STANDARDS AND TECHNOLOGIES 9 Hrs

Current and Future Technologies- Infrared,Radio, Spread Spectrum, OFDM, Current and Future Standards-IEEE 802, 802.11, The ABC‘s of802.11, 802.11b, 802.11a, 802.11g, 802.11j, 802.11h and 5GPP, 802.11e, 802.11i, 802.11f, IEEE802.15, IEEE 802.16, IEEE 802.1x, ETSI, Home RF, Ultra wideband Radio (UWB).

UNIT–V: BLUETOOTH SECURITY: **9 Hrs**

Basic specifications, Pico-nets, Bluetooth security architecture,Scatter-nets, Security at the baseband layer and link layer, Frequency hopping, Security manager,Authentication, Encryption, And Threats to Bluetooth security

TEXTBOOKS:

1. Merritt Maxim and David Pollino, ‖Wireless Security‖, Osborne/McGraw Hill, New Delhi, 2005

2. Nichols and Lekka, ―Wireless Security-Models, Threats and Solutions‖, Tata McGraw – Hill, New Delhi, 2006.

3. Charles P. Fleeger, "Security in Computing", Prentice Hall, New Delhi, 2009

REFERENCEBOOKS:

1. Behrouz A.Forouzan, ―Cryptography & Network Security, Tata McGraw Hill, India, New Delhi, 2009.

2. William Stallings, ―Cryptography and Network Security, Prentice Hall, New Delhi, 2006.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C01	**3**												**2**	1	1
C02	**3**	**3**											**3**	1	1
C03	**3**	**3**	**3**										**3**	1	1
C04	**3**	**3**	**3**										**3**	1	3
C05	**3**					**1**							**2**		
Average	**3**	**3**	**3**			**1**							**3**	1	1.5
Level of Correlation	**3**	**3**	**3**			**1**							**3**	1	2

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester -CSE(CS)
III B.Tech II Semester (Common to CSE, IT)
IV B.Tech I Semester ME(Open Elective-IV)

L	T	P	C
3	-	-	3

20ACS31:ETHICAL HACKING
(Professional Elective -I)

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 **8 Hrs**

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 : **10 Hrs**

System Hacking, Trojans, Backdoors, Viruses, and Worms: The simplest way to get password – Types of passwords – Cracking a password - Understanding Key loggers and Other Spyware Technologies - Escalating Privileges - Understanding Rootkits - Hiding Files - Trojans and Backdoors - Viruses and Worms.

UNIT III **9 Hrs**

Sniffers, Denial of service and Session hijacking:

Understanding Host-to-Host Communication - How a Sniffer Works - Sniffing Countermeasures - Bypassing the Limitations of Switches - Wireshark Filters - Understanding MAC Flooding and DNS Spoofing - Denial of Service - Session Hijacking –

UNIT IV **10 Hrs**

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 **9Hrs**

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 Honeypot 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.

REFERENCEBOOKS:

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

MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**	**2**						**2**					**3**	**1**	**1**
1CO2	**3**	**2**						**2**					**3**	**1**	
CO3	**3**	**2**						**2**					**2**		**1**
CO4	**3**	**3**	**2**		**1**			**2**					**2**	**2**	**1**
Average	**3**	**2.25**	**2**		**1**			**2**							
Level of Correlation	**3**	**2**	**2**		**1**			**2**							

3 – High Mapping 2 – Medium Mapping 3 – Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester- CSE(CS)

L	T	P	C
3	-	-	3

20ACC07:Parallel Computer Architectures

(Professional Elective -I)

Course outcomes:

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

1. Demonstrate knowledge on basic fundamentals of Computer Architecture Design, Warehouse scale computers
2. Analyze the performance of cache and virtual memory architectures using optimization techniques.
3. Select suitable technique among branch prediction and dynamic scheduling to improve the functionality of instruction level.
4. Analyze the performance of Uniprocessor system using multi-threading.
5. Apply data level parallelism on vector, SIMD and GPU architectures to detect and increase the efficiency of loop level parallelism.

UNIT I: FUNDAMENTALS OF QUANTITATIVE DESIGN AND ANALYSIS 10 Hrs

Introduction: Classes of Computers, Defining Computer Architecture, Trends in Technology, Trends in Power and Energy in Integrated Circuits, Trends in Cost, Dependability, Measuring, Reporting, and Summarizing Performance, Quantitative Principles of Computer Design.

UNIT II: MEMORY HIERARCHY DESIGN 08 Hrs

Optimizations of cache performance: Ten Advanced Optimizations of Cache Performance, Memory Technology and Optimizations. **Protection**: Virtual Memory and Virtual Machines.

UNIT III: INSTRUCTION LEVEL PARALLELISM AND ITS EXPLOITATION 9 Hrs

ILP: Concepts and Challenges, Reducing Branch Costs with Advanced Branch Prediction, Overcoming Data Hazards with Dynamic Scheduling. **Dynamic scheduling**: Hardware Based Speculation, Studies of the Limitations of ILP.

Multithreading: Exploiting Thread Level Parallelism to Improve Uniprocessor Throughput.

UNIT IV: DATA LEVEL PARALLELISM 08 Hrs

Vector, SIMD, and GPU Architectures: Vector Architecture, SIMD Instruction Set Extensions for Multimedia, Graphics Processing Units, Detecting and Enhancing Loop Level Parallelism.

UNIT V: THREAD LEVEL PARALLELISM 10 Hrs

Shared memory: Centralized Shared Memory Architectures, Performance of Symmetric Shared Memory Multiprocessors, Distributed Shared Memory and Directory Based Coherence.

Synchronizaton: Models of Memory Consistency, Multi core Processors and Their Performance.

Warehouse scale computers: Computer Architecture of Warehouse Scale Computers, Physical Infrastructure and Costs of Warehouse Scale Computers.

TEXTBOOK:

1. John L. Hennessy and David A. Patterson, Computer Architecture: A Quantitative Approach, 5th Edition, the Morgan Kaufmann, 2012.

REFERENCEBOOKS:

1. David A Patterson, John L. Hennessy, Computer Organization and Design: Hardware/Software Interface, Morgan Kaufman Publishers, 2014.
2. David E. Culler and Jaswinder Pal Singh, with Anoop Gupta.Parallel Computer Architecture: A Hardware/Software Approach. Morgan Kaufmann, 1998.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	3	1	1
CO2	2	3	2	2	1	-	-	-	-	-	-	-	1	2	
CO3	3	3	2	-	-	-	-	-	-	-	-	-	2	2	
CO4	2	3	1	2	1	-	-	-	-	-	-	-	1	2	1
CO5	3	3	2	-	-	-	-	-	-	-	-	-	1	1	2
Average	2.5	3	1.8	2	1	-	-	-	-	-	-	-	1.6	1.6	1.3
Level of correlation of the course	3	3	2	2	1	-	-	-	-	-	-	-	2	2	1

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester- CSE(CS)

L	T	P	C
3	-	-	3

20ACC08:QUANTUM COMPUTING

(Professional Elective -I)

Course Outcomes:

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

1: Analyze the performance of data transmission between the systems using quantum computing algorithms.
2: Identify suitable technique to minimize complexity of different computational problems.
3: Apply quantum search algorithms of find quantum information for speeding up the solutions of NP-complete problems.
4: Apply three qubit phase flip code & shor code to discretize and correcting the errors.
5: Identify suitable cryptography algorithm to provide security for quantum information.

UNIT- I: INTRODUCTION OF QUANTUM COMPUTING AND OVERVIEW 10 Hrs

History of quantum computation and quantum information, Quantum bits, Multiple qubits, Quantum computation, Single qubit gates, Multiple qubit gates, Measurements in bases other than the computational basis, Quantum circuits, Qubit copying circuit, Example: Bell states, Example: quantum teleportation.

Quantum algorithms: Classical computations on a quantum computer, Quantum parallelism, Deutsch's algorithm, The Deutsch–Jozsa algorithm, Quantum algorithms summarized.

UNIT- II: INTRODUCTION TO COMPUTER SCIENCE 9 Hrs

Models for computation, Turing machines, Circuits, The analysis of computational problems, How to quantify computational resources, Computational complexity, Decision problems and the complexity classes P and NP, A plethora of complexity classes, Energy and computation, Perspectives on computer science.

UNIT-III: QUANTUM SEARCH ALGORITHMS 9 Hrs

The quantum search algorithm, Quantum search as a quantum simulation, Quantum counting, Speeding up the solution of NP-complete problems, Quantum search of an unstructured database, Optimality of the search algorithm, Black box algorithm limits.

UNIT- IV: QUANTUM ERROR-CORRECTION 9 Hrs

The three qubit bit flip code, Threequbit phase flip code, The Shor code, Theory of quantum error-correction Discretization of the errors, Independent error models, Degenerate codes, the quantum Hamming bound.

UNIT- V: QUANTUM CRYPTOGRAPHY 8 Hrs

Private Key cryptography, Privacy amplification and information reconciliation, Quantum key distribution, Privacy and coherent information, The security of quantum key distribution.

TEXTBOOK:

1. Nielsen and Chuang, Quantum Computation and Quantum Information, 10th Anniversary Edition, Cambridge University Press, 2010.

REFERENCEBOOKS:

1. Chris Bernhardt, Quantum Computing for Everyone, MIT Press 2019.
2. V.K Sahni, Quantum Computing (with CD), TATA McGrawHill 2007.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	2	2	-	-	-	-	-	-	-	2	1	1
CO2	3	3	-	1	-	-	-	-	-	-	-	-	2	2	2
CO3	3	2	-	-	2	-	-	-	-	-	-	-	3	3	1
CO4	3	2	-	-	2	-	-	-	-	-	-	-	2	2	
CO5	3	2	-	2	2	-	-	-	-	-	-	-	3	2	2
Average	3	2.4	-	1.6	2		-	-	-	-	-	-	2.4	2	1.5
Level of correlation of the course	3	3	-	2	2		-	-	-	-	-	-	2	2	2

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester (Common to CSE,IT,CSE(DS),CSE(AI &ML),CSE(CS),CSE(AI)CSE(IOT))

L	T	P	C
3	-	-	3

20AEC31:DIGITAL LOGIC DESIGN
(Open Elective -I)

Course outcomes:

After Successful completion of the course the student will be able to:

1. Understand the number system and boolean algebra functions.
2. Implement various logic gates using boolean expressions.
3. Design combinational and sequential circuits for various Digital IC applications.
4. 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.

TEXTBOOKS:

1.Digital Design, 5/e, M.Morris Mano, Michael D Ciletti, PEA.

2.Fundamentals of Logic Design, 5/e, Roth, Cengage.

REFERENCEBOOKS:

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.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2													
CO2	2	2	3	1											
CO3	3		2												
CO4	2	2	1	3											
Average	2.5	2	2	2											
Level of Correlation	3	2	2	2											

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester (Common to CSE,IT,CSE(DS),CSE(AI &ML),CSE(CS))

L	T	P	C
3	-	-	3

20AME18:ROBOTICS AND ARTIFICIAL INTELLIGENCE
(Open Elective I)

Course Outcomes:

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

1. Demonstrate the knowledge in an application of AI, and select strategies based on application requirement.
2. 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.
3. Summarize the perception about robot components, actuators, sensors and machine vision.
4. Analyze the manipulator kinematics, dynamics for typical robots which will be used for complex operations and analyze the path planning for typical robots.
5. 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: I INTRODUCTION OF AI 10 Hrs

Artificial Intelligence: Introduction to Artificial Intelligence (AI), History. AI techniques, LISP programming, AI and Robotics, LISP in the factory, sensoring 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 9 Hrs

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 10 Hrs

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 10 Hrs

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 8 Hrs

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.

REFERENCEBOOKS :

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.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3												2	1	1
CO2	3												2		
CO3	3	3	3												
CO4	3	3	3	3											
CO5	3	3													1
Average	3	1.8	1.2	0.6									2	1	0.4
Level of correlation	3	2	1	1									2	1	1

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester (Common to CSE,IT,CSE(DS),CSE(AI &ML),CSE(CS),CSE(AI),CSE(IOT))

L	T	P	C
3	-	-	3

20ACE35:INTEGRATED WASTE MANAGEMENT FOR SMART CITY
(Open Elective I)

Course Outcomes:

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

1. Comprehend the current issues and management in solid waste.
2. Choose the best method of managing the Municipal solid waste.
3. Analyse the various disposal methods of solid waste to choose the best method.
4. Appreciate various processes of Managing the construction and demolition waste.
5. Explicate into the issues and scope of electronic waste management

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 20 Smart Cities in the Country.

UNIT II MUNICIPAL SOLID WASTE MANAGEMENT

Municipal Solid Waste, Characteristics and Quantities, Collection, Transportation, Segregation and Processing.

UNIT III DISPOSAL OF MUNICIPAL SOLID WASTE

Landfill, 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, Issues and Status in India and globally, controlling measures, E-Waste Management Rules 2016 and 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 T chobanoglous, Hilary Theisen and Samuel A Vigil, “Integrated Solid Waste Management”,Tata Mc GrawHill, 1993.

3. The Central Public Health and Environmental Engineering Organization (CPHEEO),“Manualon Solid Waste Management”, India, 2016.

REFERENCEBOOKS:

1.“Municipal Solid Waste Management Rules2016”,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.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester CSE(CS)

L	T	P	C
3	-	-	3

20ACC09 : DATABASE SECURITY

(Job Oriented Elective –I)

COURSE OUTCOMES:

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

1. Understand the Web architecture and applications
2. Understand client side and service side programming
3. Understand how common mistakes can be bypassed and exploit the application
4. Identify common application vulnerabilities

UNIT - I **9 HRS**

The Web Security, The Web Security Problem, Risk Analysis and Best Practices Cryptography and the Web: Cryptography and Web Security, Working Cryptographic Systems and Protocols, Legal Restrictions on Cryptography, Digital Identification

UNIT - II **9 HRS**

The Web‘s War on Your Privacy, Privacy-Protecting Techniques, Backups and Antitheft, Web Server Security, Physical Security for Servers, Host Security for Servers, Securing Web Applications

UNIT - III **9 HRS**

Database Security: Recent Advances in Access Control, Access Control Models for XML, Database Issues in Trust Management and Trust Negotiation, Security in Data Warehouses and OLAP Systems

UNIT - IV **9 HRS**

Security Re-engineering for Databases: Concepts and Techniques, Database Watermarking for Copyright Protection, Trustworthy Records Retention, Damage Quarantine and Recovery in Data Processing Systems,

UNIT - V **9 HRS**

Future Trends Privacy in Database Publishing: A Bayesian Perspective, Privacy-enhanced Location based Access Control, Efficiently Enforcing the Security and Privacy Policies in a Mobile Environment.

TEXTBOOKS:

1. Web Security, Privacy and Commerce Simson GArfinkel, Gene Spafford, O‘Reilly.
2. Handbook on Database security applications and trends Michael Gertz, Sushil Jajodia

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**												**2**		
CO2	**3**												**2**		
CO3	**3**												**2**		
CO4	**2**	**1**											**2**		
Average	**2.75**	**1**											**2**	**1**	
Level of correlation	**3**	**1**											**2**	**1**	

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester -CSE(CS),CSE(Minor degree in cyber security)

L	T	P	C
3	-	-	3

20ACS84:STEGANOGRAPHY AND DIGITALWATERMARKING
(Job Oriented Elective –I)

COURSE OUTCOMES:

After completion of this course, the students 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 **9 Hrs**

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 Non adaptive Algorithms- Active and MaliciousAttackers- Information Hiding in Written Text.

UNIT II – INTRODUCTION TO WATERMARKING TECHNIQUES **8 Hrs**

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 - Mergingthe Watermark and the Cover - Optimization of the Watermark Receiver Extensions from StillImages to Video

UNIT III Digital Watermarking **9 Hrs**

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, GeometricTransformation. Cryptographic Attack, Protocol Attacks, Watermarking Tools.

UNIT IV Introduction to Digital Steganography 8 Hrs

Types of Steganography- Applications of Steganography- Embedding Security and Imperceptibility- Examples of Steganographic Software- Steganalysis-Introduction andTerminology - 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 8 Hrs

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 ofCopyright Laws on the Internet.

TEXTBOOKS:

1.Stefan Katzenbeisser, Fabien, A.P. Petitcolas., "Information Hiding Techniques forSteganography and Digital Watermarking", Artech House.

2.Frank Y. Shih., "Digital Watermarking and Steganography: Fundamentals andTechniques", CRC Press.(2nd edition)

REFERENCEBOOKS:

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- PO Mapping

CO	PO 1	PO2	PO 3	PO 4	PO 5	PO6	PO7	PO8	PO 9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	-	-	-	-	-	-	3	2	2
CO2	2	1	1	-	-	-	-	-	-	-	-	-	2	1	1
CO3	3	3	2	1	-	-	-	-	-	-	-	-	2	2	1
CO4	3	2	1	-	-	-	-	-	-	-	-	-	3	2	1
CO5	3	3	2	2	-	-	-	-	-	-	-	-	2	2	1
Average	2.8	2.2	1.4	1.5									2.4	1.8	1.2
Level of correlation	3	2	1	2									3	2	1

3 – High Mapping 2 – Medium Mapping 3 – Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING &TECHNOLOGY
(AUTONOMOUS)

II B.Tech I Semester CSE(CS)

L	T	P	C
3	0	0	0

20ACC10:CRYPTOGRAPHY LAB

COURSE OUTCOMES:

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

CO1: Develop a code for classical encryption techniques**.**

CO2: Build a symmetric and asymmetric algorithms**.**

CO3: Construct a code for various Authentication schemes**.**

CO4: Apply the principles of digital signature**.**

LIST OF EXPERIMENTS:

1. Write a program to implement the following cipher techniques to perform encryption and decryption

i. Caesar Cipher

ii. Playfair Cipher

iii. Hill Cipher

2. Write a program to implement the following transposition techniques

(i) Rail fence technique –Row major transformation

(ii) Rail fence technique - Column major transformation

3. Write a program to implement DES algorithm

4. Write a program to implement AES algorithm

5. Write a program to implement RSA Encryption algorithm

6. Write a program to implement the Diffie-Hellman Key Exchange mechanism. Consider one of the parties as Alice and the other party as bob.

7. Write a program to calculate the message digest of a text using the SHA-1 algorithm.

8. Write a program to calculate the message digest of a text using the MD-5 algorithm.

9. Write a program to implement digital signature standard.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PS03
CO1	3	**3**	**3**	3	3	-	-	-	3	-	-	1	3	3	3
CO2	3	3	3	3	3	-	-	-	3	-	-	1	3	3	3
CO3	3	3	3	3	3	-	-	-	3	-	-	1	3	3	3
CO4	3	3	3	3	3	-	-	-	3	-	-	1	3	3	3
CO5	**3**	**3**	**3**	**3**	**3**	**3**	**1**	**3**	**3**				3	3	3
Average	3	**3**	**3**	3	3	-	-	-	3	-	-	1	3	3	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester (Common to CSE,IT,CSE(DS),CSE(AI & ML),CSE(CS),CSE(AI),CSE(IOT))

L	T	P	C
-	-	3	1.5

20ACS26:COMPUTER NETWORKS LAB

COURSE OUTCOMES:

After completion of the course, students 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 network performances.

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.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C01	**3**	**2**	**2**		**1**								**3**	**1**	**1**
C02	**3**	**3**	**3**	**3**									**3**	**1**	**1**
C03	**3**												**3**	**1**	**1**
C04	**3**	**3**	**3**	**2**	**2**								**3**	**2**	**1**
Average	**3**	**2.66**	**2.66**	**2.5**	**1.5**								**3**	**1.25**	**1**
Level of Correlation	**3**	**3**	**3**	**3**	**2**								**3**	**1**	**1**

3- High mapping 2-Medium Mapping 1- Low Mapping

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L	T	P	C
1	-	2	1

20AHS16:ADVANCED ENGLISH COMMUNICATION SKILLS(Skill Course)

Course Outcomes:

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

1. Understand language fluency through conversational practices and demonstrate appropriate body language during communication.
2. Apply synonyms, antonyms, one-word substitutes, prefixes and suffixes to develop vocabulary to comprehend oral and written communication.
3. Analyze reading and writing techniques in preparing letters, resumes and technical reports by examining and applying guessing meaning, scanning, skimming and interfering meaning.
4. 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 **9 Hrs**

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 **9 Hrs**

READING COMPREHENSION: General vs. Local Comprehension, Reading for Facts, Guessing meanings from Context, Skimming, Scanning and inferring meaning.

UNIT-III **9 Hrs**

WRITING SKILLS: Structures and Presentation of different types of writing – Letter writing, Resume writing, e-correspondence and Technical report writing.

UNIT-IV **9 Hrs**

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 **9 Hrs**

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.

Suggested Software:

•Sky Pronunciation

•Pro-power 2

•Globarena Software

REFERENCEBOOKS:

1.Kumar Sanjay, Pushpa Lata. English for Effective Communication, Oxford University Press, 2015.

2.Konar Nira, English Language Laboratories – A Comprehensive Manual, PHI Learning Pvt. Ltd., 2011.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO1 1	PO12	PSO1	PSO2	PSO3
CO1	2					2				3					
CO2	3	3								3					
CO3	2	2								3					
CO4									3	3					
Average	2.25	2.5				2			3	3					
Level of correlation	2	3				2			3	3					

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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

L	T	P	C
2	-	-	-

20AHS21:INDIAN CONSTITUTION

COURSE OUTCOMES:

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

1. Understand the historical background of the constitution making and its importance for building a democratic India.
2. Examine the importance of Preamble of the Indian Constitution and Parliamentary Structure.
3. Analyze decentralization of power among central, state and local self-government.
4. Demonstrate functioning of judiciary system, fundamental rights and duties of all India Services and international institutions.

UNIT-I **5 Hrs**

PREAMBLE AND ITS PHILOSOPHY: Introduction to Indian Constitution, Evolution of Indian Constitution, preamble and its philosophy.

UNIT-II **5 Hrs**

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 **6 Hrs**

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 **6 Hrs**

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 **6 Hrs**

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.

TEXT BOOK:

1. Briji Kishore Sharma, Introduction to the Constitution of India, Prentice Hall of India, 2005.

REFERENCEBOOKS:

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

CO-PO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PS03
CO1	**2**					**3**									
CO2						**3**									
CO3						**3**									
CO4						**3**		**3**							
Average	**2**					**3**		**3**							
Level of correlation	**2**					**3**		**3**							

3- High mapping 2-Medium Mapping 1- Low Mapping

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L	T	P	C
2	-	-	-

20AHS17:QUANTITATIVE APTITUDE ANDREASONING -III

COURSE OUTCOMES:

After successful 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 **9 Hrs**

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-II **9 Hrs**

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-III **9 Hrs**

REASONING ABILITY III: Puzzles – Cubes & Dices – Algebra – Selection Decision table – Visual reasoning – Inequalities

UNIT-IV **9 Hrs**

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-V **9 Hrs**

SOFT SKILLS III: Written Communication - Listening Skills - Mentoring & Coaching - Decision Making - Competitiveness - Inspiring & Motivating.

TEXTBOOKS:

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

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L	T	P	C
2	-	-	-

20AHS18:FRENCH LANGUAGE

Course Outcomes:

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

1. Understand basic knowledge of French language and analyze several core competencies.
2. Develop and improve comprehensive capabilities and apply simple phrases & sentences in real-life conversation.
3. Analyze ability to ask and answer questions about the self, personal interest, everyday life, and the immediate environment.
4. Demonstrate knowledge of tenses in making sentences for day-to-day conversations in different time frame.

UNIT-I **10 Hrs**

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.

UNIT-II **8Hrs**

RENDEZVOUS: Conversation, approaching someone, Tele conversation, Buying a train ticket, Numbers the formula to write a post card, Culture and Life in France.

UNIT-III **9 Hrs**

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.

UNIT-IV **8 Hrs**

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.

UNIT-V **10 Hrs**

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: favor & against, A French Weekend.

TEXTBOOKS:

1.CAMPUS 1 Method de FranCSE(AI)s, Jacques Pecheur et Jacky Girardet, CLE International Paris 2002.

2.La France de toujours, Nelly Mauchamp; CLE international.

3.Sans Frontireres - Vols. 1, 2, & 3 – Hachette.

REFERENCEBOOKS:

1.Declic 1; Jacques Balnc, Jean-Michel Cartier, Pierre Lederlion; CLE International.

2.Nouveau Sans Frontieres – Vols. 1, 2 & 3.

3.Cours de langue et de civilisation FranCSE(AI)se – Hachette.

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

L	T	P	C
2	-	-	-

20AHS19:GERMAN LANGUAGE

COURSE OUTCOMES:

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

1. Understand fundamental knowledge to learn German language, sounds, pronunciations, sentence structures and the verb conjugation.
2. Comprehend and apply the knowledge of vocabulary and phrases in day-to-day real-life conversation.
3. Analyze various sentence structures by examining the rules of grammar in speaking and writing.
4. Demonstrate various verb structures of English and German language effectively in professional writing.

UNIT-I **10 Hrs**

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.

UNIT-II **8 Hrs**

SENTENCE FORMATION: Infinite sentences, use of conjunctive-I and conjunctive-II, plusquam perfect, modal verb, Conjunction, temporal, subordinate clauses & complex sentences.

UNIT-III **9 Hrs**

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-IV **8 Hrs**

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-V **10 Hrs**

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.

TEXTBOOKS:

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.

REFERENCEBOOKS:

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.

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

L	T	P	C
2	-	-	-

20AHS20:JAPANESE LANGUAGE

COURSE OUTCOMES:

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

1. Remember and understand Japanese alphabet and demonstrate basic structures of sentences in reading and writing.
2. Examine the limitations of language by examining pronouns, verbs form, adjectives and conjunctions.
3. Analyze the skills of vocabulary and apply it to learn time and dates and express them in Japanese.
4. Demonstrate the formation of simple questions and answers in Japanese to know the Japanese culture and etiquette.

UNIT-I **8 Hrs**

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 and 20pronouns, Greetings.

UNIT-II **10 Hrs**

DEMONSTRATIVE PRONOUNS, VERBS AND SENTENCE FORMATION: Grammar: N1 wa N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sore, Are and Dore (This, That, Over there, which) Kono, sono, Ano and Dono (this, that, over there, which) Kochira, Sochira, Achira and Dochira. This way....) Koko, Soko, Asoko and Doko (Here, There,...location), Classification of verbs Be verb desu Present and Present negative Basic structure of sentence (Subject+ Object+ Verb) Katakana-reading and writing.

UNIT-III **8 Hrs**

CONJUNCTION, ADJECTIVES, VOCABULARY AND ITS MEANING: Conjunction-Ya…..nado Classification of Adjectives 'I' and 'na'-ending Set phrase – Onegaishimasu – Sumimasen, wakarimasen Particle –Wa, Particle-Ni 'Ga imasu' and 'Gaarimasu' for Existence of living things and non-living things Particle-Ka, Ni, Ga, Days/ Months /Year/Week (Current, Previous, Next, Next to Next); Nation, People and Language Relationship of family (look and learn); Simple kanji recognition.

UNIT-IV **10 Hrs**

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 **9 Hrs**

EXPRESSING TIME, POSITION AND DIRECTIONS: Classification of question words (Doko, Dore, Dono, Dochira); Time expressions (Jikan), Number of Hrs, Number of months, calendar of a month; Visiting the departmental store, railway stations, Hospital (Byoki), office and University.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

II B.Tech II Semester (Common to CSE, IT, CSD,CDM,CSE (CS),CSE (AI),CSE (IOT))

L	T	P	C
3	-	-	3

20AIT04: SOFTWARE ENGINEERING

COURSE OUTCOMES:

At the end 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, projectscheduling, staffing, Organization and team structure, risk management, configuration management.

UNIT - II

REQUIREMENTS ANALYSIS AND SPECIFICATION: The nature of software, The Unique natureof 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 userinterface, 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, CASEenvironment, 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

Learning Resources:

1. https://nptel.ac.in/courses/106/105/106105182/
2. http://peterindia.net/SoftwareDevelopment.html

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3										3	1
CO2	3	3	2	3	1								3	1
CO3	3	2	1										3	2
CO4	3	2											3	3
Average	3	2.25	1.33	3	1								3	1.75
Level of correlation	3	3	2	3	1								3	2

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
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III B.Tech II Semester (Common to CSE,IT,CSE(DS),CSE(AI &ML),CSE(CS))

L	T	P	C
3	-	-	3

20ACS16:WEB TECHNOLOGIES

COURSE OUTCOMES:

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

1. Apply HTML Structure Elements to create web page and apply CSS to styling Web Pages.
2. Design Client-Side programs using JavaScript and Server-Side programs using PHP to construct dynamic WebPages.
3. Understand and implement Object Oriented Programming capabilities of PHP
4. Apply intermediate and advanced web development practices.

UNIT- I **9 Hrs**

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 **9 Hrs**

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 **9 Hrs**

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, MongoDB, AngularJS.

Extending JavaScript with jQuery: jQuery Foundations, Event Handling in jQuery, DOM Manipulation, Effects and Animation, AJAX, Asynchronous File Transmission,

UNIT-IV **9 Hrs**

PHP: PHP Tags, Comments, Variables, Data Types, and Constants, Writing to Output, printf, Program Control, Functions, Arrays and Superglobals, Arrays, $GET and $POST Superglobal 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 **9 Hrs**

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.

REFERENCEBOOKS:

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)

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C01	3	3	3	1	3								1	1	
C02	3	2	3	2	3								2	1	2
C03	3	3	1	1	3								1		2
C04	3	3	2	3	1								1	1	1
Average	3	2.75	2.25	1.75	2.5										
Level of Correlation	3	3	2	2	3										

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester CSE(CS)

L	T	P	C
3	-	-	3

20ACC13: SYSTEM SECURITY

Course Outcomes:

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

1. Select the suitable network protocols to protect from threats occurred in a computer.
2. Apply classical security models and international standards for providing the security to the servers in the network zone.
3. Apply Risk Remediation process to provide database security at different layers.
4. Analyze different vulnerabilities, threats, occurred in wireless network by applying
5. Apply different File Transfer Protocols to secure Infrastructure Services in web, DNS and Proxy servers.

UNIT I: INTRODUCTION 08 HRS)

Computer Security, Threats, Administrative Security, Overall Planning and Administration, Day to Day Administration, About the Internet, Network Protocols, Encryption, Data Encryption Standard.

UNIT II: OPERATING SYSTEM SECURITY MODELS (10 HRS)

Operating System Models, Classic Security Models, Reference Monitor, Trustworthy Computing, International Standards for Operating System Security.

Unix Security: Securing a Unix System, Place Servers into Network Zones, Authentication Processes, Limit the Number of Administrators and Privileges, Back Up the System, Security Lists. Windows Security: Securing Windows Systems, Active Directory Domain Architecture.

UNITIII: DATABASE SECURITY (08 HRS)

Storage Security: Storage Security Evolution, Modern Storage Security, Risk Remediation.

Database Security: General Database Security Concepts, Understanding Database Security Layers, Understanding Database-Level Security, Application Security, Database Backup and Recovery, Keeping Servers Up to Date, Database Auditing and Monitoring.

UNIT IV: WIRELESS NETWORK SECURITY (10 HRS)

Radio Frequency Security Basics, Data-Link Layer Wireless Security Features, Flaws, and Threats, Wireless Vulnerabilities and Mitigations, Wireless Network Hardening Practices and Recommendations, Wireless Intrusion Detection and Prevention, Wireless Network Positioning and Secure Gateways.

UNIT V: SECURING INFRASTRUCTURE SERVICES (09 HRS)

E-Mail: Protocols Their Vulnerabilities and Counter measures, Spam and Spam Control,Web Servers: Types of Attacks, Web Server Protection ,DNS Servers: Prevent Unauthorized Zone Transfers, DNS Cache Poisoning,Proxy Servers: HTTP, FTP, Direct Mapping, POP3, Reverse Proxy

TEXTBOOKS:

1. Rick Lehtinen,“ Computer Security Basics “,O'Reilly Media, 2nd Edition,2006.

2.Mark Rhodes-Ousley, “Information Security“, McGraw-Hill Obsorne Media, 2ndEdition, 2013.

REFERENCEBOOKS:

1.Craighead, Geoff, “High-Rise Security and Fire Life Safety”, Butterworth-Heinemann,3rdEdition,2003.

2.Fennelly, Lawrence J,”Effective Physical Security”, Butterworth-Heinemann,5thEdition 1997.

ADDITIONAL LEARNING RESOURCES:

https://onlinecourses.nptel.ac.in/noc20_cs33/preview

https://www.digimat.in/nptel/courses/video/106108058/L01.html

https://www.coursera.org/lecture/aruba-network-security-basics/introduction-to-wireless-security-efn8P

https://www.coursera.org/lecture/alibaba-cloud-security-solutions/windows-security-configuration-demo-w5JIn

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	-	-	-	-	-	-	-	3	1	
CO2	2	2	2	2	2	-	2	-	-	-	-	-	3	3	3
CO3	3	-	2	2	2	-	-	-	-	-	-	-	3	2	2
CO4	2	3	3	-	-	-	-	-	-	-	-	-	3	3	1
CO5	3	3	2	2	2	2	-	-	-	-	-	-	3	1	
Average	2.6	2.7	2.3	2	2	2	2	-	-	-	-	-	3	2	2
Level of correlation of the course	3	3	3	2	2	2	2	-	-	-	-	-	3	2	2

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester -CSE(CS)

L	T	P	C
3	-	-	3

20ACC14: PENETRATION TESTING AND VULNERABILITY ANALYSIS

(Professional Elective -II)

COURSE OUTCOMES:

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

1. Identify flaws and vulnerabilities in applications, websites, networks, systems, protocols,and configurations using both manual techniques and assistive tools.
2. Deploy and test exploits over targeting operating systems and services
3. Rich knowledge on legal and ethical issues related to vulnerability and penetration testing.
4. Ability to perform pentest on target and generate a report based on the test and determinethe security threats and vulnerabilities in computer networks.
5 .Using the acquired knowledge into practice for testing the vulnerabilities and identifying threats.

UNIT:I PENTESTING AND INFORMATION SECURITY **9 Hrs**

Pentester – Types of Hackers – Pentest Methodology – Pentest Types – Vulnerability Scanning – Vulnerability Assessments – Pentest Target and Specializations - Asset Management: CIA Triad –security Controls – Access Controls – Incident Responses – Malware – Advanced Persistent Threats – Cyber Kill Chain – Air-gapped Machines – Dark Web.

UNIT:2 RECON AND HIJACKING **9 Hrs**

Reconnaissance – External ¬- Dumpster Diving – Social Media – Social Engineering - Internal – Sniffing and Scanning – De-Authentication of Attacks – Detection Mechanism - Session Hijacking:

Blind and Non-Blind Spoofing - Detection and Prevention Mechanisms.

UNIT:3 NETWORK AND WIRELESS MAYHEM **9 Hrs**

WEP Theory – SSID - WPA – WPS -.MAC Filtering – Port Security – IPsec - War Diving: Basic Web Cracking – Detecting Wireless Attacks - Fake Authentication – Handshake Theory - Bypassing Firewalls – Evading Intruder Detection System - Securing Network from Attacks.

UNIT:4 WEB SERVER ATTACKS **9 Hrs**

Understanding Web Languages - Web Architecture - Webpage Spoofing – Information Gathering from Target Websites – Finding Subdomains – Files Based Analysis - Cookies Handling - Web Page Attacks – Attack Detection – Protection Against Web Page Attacks – MITMF Code Injection.

UNIT:5 INJECTION VULNERABILITY **9 Hrs**

Databases – Testing Database Vulnerability – Securing SQL Server – Detecting Database Attacks – Protection Against Database Attacks - File Upload Vulnerability – Inclusion Vulnerability - Code Execution – Local File – Remote File – Mitigation Strategies.

TEXT BOOKS:

1. Phillip L. Wylie, Kim Crawley, “The Pentester BluePrint: Starting a Career as an Ethical Hacker”, 2020, Wiley, United States.
2. Sabih, Zaid, “Learn Ethical Hacking from Scratch: Your stepping stone to penetration testing”, 2018 Packt Publishing Ltd, United Kingdom.

REFERENCEBOOKS

1. Diogenes, Yuri, and Erdal Ozkaya, “Cybersecurity??? Attack and Defense Strategies: Infrastructure security with Red Team and Blue Team tactics”, 2018, Packt Publishing Ltd, United Kingdom.
2. Andrew Whitaker, and Daniel P. Newman. “Penetration Testing and Network Defense”, 2005, Cisco Press, New Jersey.

CO-PO Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3												2		
CO2	3	2	1	2									3	2	3
CO3	2					1		1					3		
CO4	3	2	1	2	2								3	2	2
CO5	3	3											3	2	2
Average	2.8	2.3	1	2	2	1		1					2.8	2	2.3
Level of correlation	3	2	1	2	2	1		1					3	2	2

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester-CSE(CS)

L	T	P	C
3	-	-	3

20ACC15:SECURITY PROGRAM MANAGEMENT

(Professional Elective –II)

Course Outcomes:

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

1.

2.

3.

4.

5.

UNIT – I INFORMATION SECURITY AND RISK MANAGEMENT 10 Hrs

Security Management Concepts and Principles - Integrated Threat Management -Understanding Information Security Management Systems - Policies, Standards, Procedures, and Guidelines - Planning for a Privacy Breach, Risk Management- Using Quasi-Intelligence Resources to Protect the Enterprise - Information Risk Management: A Process Approach to Risk Diagnosis and Treatment

UNIT – II ACCESS CONTROL & CRYPTOGRAPHY 8 Hrs

Access Control Techniques - Authentication Tokens, Authentication and the Role of Tokens Access Control Administration-Accountability Methods of Attack-Rootkits: The Ultimate Malware Threat. Encryption Key Management in Large-Scale Network Deployments.

UNIT – III PHYSICAL SECURITY & SECURITY ARCHITECTURE AND DESIGN 9 Hrs

Elements of Physical Security , Principles of Computer and Network Organizations, Architectures, and Designs - Service-Oriented Architecture and Web Services Security, Analysis of Covert Channels, Security Frameworks.

UNIT – IV TELECOMMUNICATIONS AND NETWORK SECURITY 8 Hrs

Communications and Network Security - Facsimile Security Internet, Intranet, and Extranet Security -Network Content Filtering and Leak Prevention Network Attacks and Countermeasures.

UNIT – V APPLICATION SECURITY & LEGAL, REGULATIONS, COMPLIANCE, AND INVESTIGATION 9 Hrs

Application Issues -Information Technology Infrastructure Library and Security Management Overview, Quantum Computing: Implications for Security.

Information Law- Compliance Assurance: Taming the Beast, Incident Handling- Enterprise Incident Response and Digital Evidence Management and Handling, Security Information Management Myths and Facts.

TEXT BOOK :

1.Information Security Management Handbook Sixth Edition VOLUME 2 Harold F. Tipton, CISSP . Micki Krause, CISSP – Auerbach Publications, Newyork.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
Average															
Level of correlation of the course															

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester -CSE(CS)
IV B.Tech I Semester ,CSE(Honors)

L	T	P	C
3	-	-	3

20ACS70:MALWARE ANALYSIS

COURSE OUTCOMES:

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

1. Understanding malware related terms
2. Analyzing the basic dynamic analysis of malware
3. Analyzing C Code construct
4. Analyzing the advanced dynamic nature of malware
5. Understanding Kernel debug with WINDBG

UNIT-I: BASIC STATIC TECHNIQUES 9 Hrs

Antivirus Scanning, Hashing: A Fingerprint for Malware, Finding Strings, Packed and ObfuscatedMalware, Portable Executable File Format, Linked Libraries and Functions, Static Analysis in Practice, The PE File Headers and Sections , malware analysis in virtual machines, The Structure of a Virtual Machine, Creating Your Malware Analysis Machine, Using Your Malware Analysis Machine, The Risks of Using VMware for Malware Analysis.

UNIT-II: BASIC DYNAMIC ANALYSIS 9 Hrs

Sandboxes: The Quick-and-Dirty Approach, Running Malware, Monitoring with Process Monitor, Viewing Processes with Process Explorer, Comparing Registry Snapshots with Regshot, Faking a Network, Packet Sniffing with Wireshark, Using INetSim, Basic Dynamic Tools in Practice**,** Levelsof Abstraction, Reverse-Engineering, The x86 Architecture.

UNIT-III: RECOGNIZING C CODE CONSTRUCTS IN ASSEMBLY 9 Hrs

Global vs. Local Variables, Disassembling Arithmetic Operations, Recognizing if Statements, Recognizing Loops, Understanding Function Call Conventions, Analyzing switch Statements, Disassembling Arrays, Identifying Structs, Analyzing Linked List Traversal, analyzing malicious windows programs, The Windows API, The Windows Registry, Networking APIs, Following Running Malware, Kernel vs. User Mode

UNIT-IV: ADVANCED DYNAMIC ANALYSIS 9 Hrs

Debugging, Source-Level vs. Assembly-Level Debuggers, Kernel vs. User-Mode Debugging, Using a Debugger, Exceptions, Modifying Execution with a Debugger, Modifying Program Execution in Practice, OLLYDBG, Loading Malware, The OllyDbg Interface, Memory Map, Viewing Threads and Stacks, Executing Code, Breakpoints, Loading DLLs, Tracing, Exception Handling, Patching, Analyzing Shellcode, Assistance Features,

Plug-ins, Scriptable Debugging.

UNIT-V: KERNEL DEBUGGING WITH WINDBG **12Hrs**

Drivers and Kernel Code, Setting Up Kernel Debugging, Using WinDbg, Microsoft Symbols, Kernel Debugging in Practice, Rootkits, Loading Drivers, malware behavior, Downloaders and Launchers, Backdoors, Credential Stealers, Persistence Mechanisms, Privilege Escalation, Covering Its Tracks—User-Mode Rootkits, covert malware launching, Launchers, Process Injection, Process Replacement, Hook Injection, Detours, APC Injection.

Textbook Books:

- Practical Malware Analysis by by Michael Sikorski and Andrew Honig

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**2**	**3**											**3**		
CO2	**2**	**2**	**1**	**1**									**3**	**3**	
CO3	**3**	**3**		**2**									**3**	**3**	**2**
CO4	**2**	**2**	**1**	**1**									**3**	**2**	
CO5	**3**	**1**	**2**	**2**									**3**	**3**	**3**
Average	**2.4**	**2.2**	**2**	**1.5**									**3**	**2.7**	**2.5**
Level of correlation	**3**	**3**	**2**	**2**									**3**	**2**	**3**

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester -CSE(CS)

L	T	P	C
3	-	-	3

20ACS72:HIGH PERFORMANCE COMPUTING

COURSE OUTCOMES:

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

1. Execute the application of cluster computing using programming tools
2. Apply appropriate load balancing algorithm for task scheduling
3. Execute the applications applying high performance computing
4. Develop task scheduling algorithm for real time environment
5. Apply appropriate classification and clustering techniques for data analysis

UNIT-I **8Hrs**

Parallel Computing: Introduction, Theoretical concepts, Parallel Computers Architectures, Different types of memory access, Granularity of parallelism, Parallel programming, Topologies, Multi-threaded architectures, Co-processors, including GPUs, Load balancing.

UNIT-II **9Hrs**

Molecular Dynamics: Force Computation, Parallel Decompositions, Parallel Fast Fourier Transform, Integration for Molecular Dynamics, Combinatorial algorithms, Brief introduction to sorting, Odd-even transposition sort, Quicksort, Radixsort, Samplesort, Bitonic sort, Prime number finding.

UNIT-III **7Hrs**

Graph Analytics: Traditional graph algorithms, Parallelization, 'Real world' graphs, Hypertext algorithms, Large-scale computational graph theory, N-body problems, The Barnes-Hut algorithm, The Fast Multipole Method, Full computation, Implementation, Monte Carlo Methods, Motivation, Parallel Random number generation.

UNIT-IV **9Hrs**

Cloud Applications: Scientific :Healthcare: ECG analysis in the cloud, Biology: protein structure prediction, Biology: gene expression data analysis for cancer diagnosis, Geoscience: satellite image processing, Contents.

Business and consumer applications: CRM and ERP, Productivity, Social networking. Media applications: Multiplayer online gaming.

UNIT-V **10Hrs**

Energy Efficiency in Clouds: Energy-efficient and green cloud computing architecture, Market- based management of clouds, Market-oriented cloud computing, A reference model for MOCC , Technologies and initiatives supporting MOCC, Observations, Federated clouds/InterCloud , Characterization and definition, Cloud federation stack, Aspects of interest, Technologies for cloudfederations, Observations , Third-party cloud services, MetaCDN SpotCloud

TEXT BOOK:

Levesque, John, and Gene Wagenbreth. *High performance computing: programming andapplications*. CRC Press, 2010.

REFERENCEBOOKS:

Wadleigh, Kevin R., and Isom L. Crawford. *Software optimization for high-performancecomputing*. Prentice Hall Professional, 2000.

MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**	**3**	**3**	**3**									**3**	**2**	**3**
CO2	**3**	**2**	**3**	**3**									**3**	**2**	**2**
CO3	**3**	**3**	**2**	**3**									**3**	**3**	
CO4	**3**	**3**	**3**	**2**									**3**	**2**	
CO5	**3**	**2**											**3**	**2**	**2**
Average	**3**	**2.75**	**2.75**	**2.75**									**3**	**2.25**	**2.3**
Level of correlation	**3**	**3**	**3**	**3**									**3**	**2**	**2**

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester -CSE(CS)

L	T	P	C
3	-	-	3

20ACC16: SOFT COMPUTING

COURSE OUTCOMES:

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

1. Investigate soft computing techniques for solving computational problems.
2. Design efficient neural architectures to model patterns for a given learning problem.
3. Investigate and solve optimization problems using genetic algorithms.
4. Apply fuzzy logic and reasoning to handle uncertainty in engineering problems.
5. Develop intelligent solutions using hybrid soft computing techniques to solve problems of multidisciplinary domains.

UNIT–I: SUPERVISED LEARNING NETWORKS 10 Hrs

Introduction to Soft Computing: Neural networks, Application scope of neural networks, Fuzzy logic, Genetic algorithm, Hybrid systems, Softcomputing. Artificial Neural Networks: Fundamentals, Basic Models, Terminologies, Linear Separability, Hebb network.

Supervised Learning Networks: Perceptron Networks- Theory, Perceptron learning rule, Architecture, Flowchart for training process, Perceptron training algorithm for single and multiple output classes, Perceptron network testing algorithm;

UNIT–II: UNSUPERVISED LEARNING NETWORKS 08 Hrs

Fixed weight competitive nets – Maxnet, Mexican Hat Net, Hamming network; Kohonen self-organizing feature maps – Theory, Architecture, Flowchart, Training algorithm; Learning vector quantization – Theory, Architecture, Flowchart, Training algorithm, Variants; Counter propagation networks – Theory, Full counter propagation Net, Forward-only counter propagation Net

UNIT–III:GENETIC ALGORITHMS 09 Hrs

Genetic algorithms- Biological background, Traditional optimization and search techniques, Genetic algorithm and search space, Genetic algorithms vs traditional algorithms, Basic terminologies in genetic algorithm, Simple GA, General genetic algorithm, Operators in genetic algorithm, Stopping condition for genetic algorithm flow, Constraints in genetic algorithm, Problem solving using genetic algorithm, Adaptive genetic algorithms, Hybrid genetic algorithms

UNIT–IV: FUZZY LOGIC 11 Hrs

Introduction to fuzzy logic, Classical sets, Fuzzy sets, Membership function – Features, Fuzzification, Methods of membership value assignments; Fuzzy arithmetic and measures–Fuzzy arithmetic, Extension principle, Fuzzy

measures, Measures of fuzziness, Fuzzy integrals; Fuzzy rule base and approximation reasoning -Truth values and tables in fuzzy logic, Fuzzy propositions, Formation of rules, Compound rules

UNIT–V: Hybrid Soft Computing Techniques and Applications 07 Hrs

Hybrid Soft Computing Techniques: Genetic neuro hybrid systems, Genetic fuzzy hybrid and fuzzy genetic hybrid systems. Applications of Soft Computing: Optimization of traveling salesman problem using genetic algorithm approach, Genetic algorithm-based internet search technique, Soft computing-based hybrid fuzzy controllers,

TEXT BOOK:

1.S. N. Sivanandam and S. N. Deepa, Principles of Soft Computing, Wiley, 3rd Edition, 2019.

REFERENCEBOOKS:

1.S. Rajasekaran and G. A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic and Genetic Algorithms:Synthesis and Applications, PHI Learning Private Ltd, 2011.

2.Udit Chakraborty, Samir Roy, Soft Computing: Neuro-Fuzzy and Genetic Algorithms, Pearson, 2013.

3.Saroj Kaushik, Sunita Tewari, Soft Computing: Fundamentals, Techniques and Applications, McGraw Hill, 2018.

ADDITIONAL LEARNING RESOURCES:

1.https://nptel.ac.in/courses/106105173/

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	3	3	1
CO2	3	3	3	1	-	-	-	-	-	-	-	-	2	2	
CO3	3	2	-	-	-	-	-	-	-	-	-	-	3	3	2
CO4	3	2	-	-	-	-	-	-	-	-	-	-	3	3	1
CO5	3	3	3	-	-	2	-	-	-	-	-	-	3	3	3
Average	3	2.5	3	1	-	-	-	-	-	-	-	-	2.8	2.8	1.2
Level of correlation of the course	3	3	3	1	-	2	-	-	-	-	-	-	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),CSE(CS),CSE(AI))

L	T	P	C
3	-	-	3

20AEC45: MICROPROCESSORS AND INTERFACING

COURSE OUTCOMES:

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

1. Know the architecture of 8086 microprocessors
2. Understand the programming & Instruction set of 8086 microprocessors
3. Design interfacing of various programmable peripheral devices with microprocessors and micro controllers
4. Understand about operating modes of advanced microprocessors

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.

TEXTBOOKS:

1.Advanced Microprocessor and Peripherals, A.K.Ray and K.M.Bhurchandi, TMH, 2000.

2.Micro Controllers, Deshmukh, Tata McGraw Hill Edition,2005.

REFERENCEBOOKS:

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.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**	**1**											
CO2	**2**	**2**		**1**										
CO3	**2**	**2**	**1**											
CO4	**2**	**2**		**1**										
Average	**2.25**	**2**	**1**	**1**										
Level of Correlation	**2**	**2**	**1**	**1**										

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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

L	T	P	C
3	-	-	3

20AMB09:INTELLECTUAL PROPERTY RIGHTS

Course Outcomes:

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

1. Outline different types of intellectual properties.
2. Distinguish the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development.
3. Formulate designs, patent and copyright for their innovative research works.
4. Apply intellectual property law principles of Trademarks to real problems.
5. 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.

TEXTBOOKS:

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.

REFERENCEBOOKS:

1.Bouchoux, E.B. Intellectual Property Rights, Cengage Learning.

2.Ganguli, P. Intellectual Property Rights– Unleash my Knowledge Economy. TataMcGraw Hill Publishing Company Ltd.

3.Wadhera, B.L. Intellectual Property Law, Universal Publishers.

Mapping:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1			**3**								**3**			
CO2			**3**								**3**			
CO3			**3**								**3**			
CO4			**3**								**3**			
CO5			**3**								**3**			
Average			3								3			
Level of correlation			3								3			

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester (Common to CSE,IT,CSE(DS),CSE(AI &ML),CSE(CS),CSE(AI))

L	T	P	C
3	-	-	3

20AME31:OPERATIONS RESEARCH

Course Outcomes:

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

1. Summarize various LPP, TPP, AP, sequencing, replacement, game theory, project management, and queuing models of operations Research.
2. Illustrate the application of OR models to identify solutions to industry.
3. Identify the optimum solutions with system approach to both industry and service sector.
4. Judge the advanced software tools for decision making with available sources for cost reduction and profit maximization with society concern.

UNIT: I INTRODUCTION AND LINER PROGRAMMING 12 Hrs

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 12 Hrs

Transportation: Introduction – Methods of basic feasible solution, Optimality test, Degeneracy in transportation problem, unbalanced transportation Problem, -- Assignment problem – Introduction – unbalanced model -- optimal solution – Hungarian method, - un-balanced assignment problems- travelling salesman problem.

UNIT: III REPLACEMENT AND WAITING LINE PROBLEMS 12 Hrs

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 12 Hrs

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 12 Hrs

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.

Textbook(s)

1.Taha, Introduction to Operations Research, New Delhi, 8th Edition, Printice Hall International Publisher, 2016.

2 A.M. Natarajan, P. Blalsubramani & A Tamilarasi, Operations Research, New Delhi. 1st Edition, Pearson Piblishers, 2005.

REFERENCEBOOKS

1 Hiller & Liberman, Introduction to Operations Research, Noida RC, 7th Edition,Tata Mc Graw Hill publication

2 R. Panneer selvam, Operations Research, New Delhi, 2nd Edition, Prentice Hall International Publisher, 2006

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester- CSE(CS)

L	T	P	C
3	-	-	3

20ACC17:INTRUSION DETECTION SYSTEMS

COURSE OUTCOMES:

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

1. Explain the fundamental concepts of Network Protocol Analysis and demonstrate the skill to capture and analyze network packets.
2. Use various protocol analyzers and Network Intrusion Detection Systems as security tools to detect network attacks and troubleshoot network problems.

UNIT-I **9 Hrs**

Introduction to Intrusion Detection and Snort: Intrusion Detection definitions, Network Topology, Honey Pots, Security Zones and Levels of Trus, IDS Policy, Components of Snort, Dealing with Switches, TCP Stream Follow Up, Supported Platforms, How to Protect IDS Itself

UNIT-II **9 Hrs**

Intrusion Prevention Systems: Intrusion Detection System (IDS), working of IDS ,Classification of Intrusion Detection System, Network Intrusion Detection System (NIDS):, Host Intrusion Detection System (HIDS): , Protocol-based Intrusion Detection System (PIDS):, Application Protocol-based Intrusion Detection System (APIDS):, Hybrid Intrusion Detection System, Benefits of IDS, Detection Method of IDS

UNIT-III

Installing Snort and Getting Started: Snort Installation Scenarios, Installing Snort, Running Snort on Multiple Network Interfaces, Snort Command Line Options, Step-By-Step Procedure to Compile and Install Snort From Source Code, Location of Snort Files, Snort Modes, Snort Alert Modes

UNIT-IV

Working with Snort Rules, Rule Headers, Rule Options, The Snort

Configuration File etc. Plugins, Preprocessors and Output Modules, Using Snort with MySQL

UNIT-V

Using ACID and Snort Snarf with Snort, Agent development for intrusion detection, Architecture models of IDs and IPs.

TEXTBOOK:

1. Rafeeq Rehman : " Intrusion Detection with SNORT, Apache,MySQL, PHP and ACID," 1st Edition, Prentice Hall , 2003.

REFERENCEBOOKS:

1. Christopher Kruegel,Fredrik Valeur, Giovanni Vigna: "Intrusion Detection and Correlation Challenges and

Solutions", 1st Edition, Springer, 2005.

2. Carl Endorf, Eugene Schultz and Jim Mellander " Intrusion Detection & Prevention", 1st Edition, Tata McGraw-Hill, 2004.
3. Stephen Northcutt, Judy Novak : "Network Intrusion Detection", 3rd Edition, New Riders Publishing, 2002.
4. T. Fahringer, R. Prodan, "A Text book on Grid Application Development and Computing Environment". 6th Edition, KhannaPublihsers, 2012.

MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**	**3**													
CO2	**3**	**3**	**2**	**1**	**2**										
Average	**3**	**3**	**2**	**1**	**2**										
Level of correlation	**3**	**3**	**2**	**1**	**2**										

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester -CSE(CS)

L	T	P	C
3	-	-	3

20ACC18: SOFTWARE SECURITY

COURSE OUTCOMES:

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

1. Analyze security threats, risks, and attacks to secure the software systems.
2. Identify the secure requirements for SQUARE process model, requirements elicitation and prioritization.
3. Analyze secure architectures by performing risk analysis and following security guidelines.
4. Evaluate the security analysis in the perspective of software functionality and attacker.
5. Apply coding and testing analysis to validate secure coding for software development.
6. Analyze secure project management and legal reviews for enterprise software.

UNIT I: SECURITY A SOFTWARE ISSUE **09 Hrs**

Introduction, The problem, Software Assurance and Software Security, Threats to software security, Sources of software insecurity, Benefits of Detecting Software Security What Makes Software Secure: Properties of Secure Software, Influencing the security properties of software, Asserting and specifying the desired security properties.

UNIT II: REQUIREMENTS ENGINEERING FOR SECURE SOFTWARE **09 Hrs**

Introduction, Misuse and Abuse Cases, The SQUARE process Model, SQUARE Sample Outputs Requirements Elicitation, Requirements Prioritization: Identify Candidate Prioritization Methods, Prioritization Technique Comparison, Recommendations for Requirements Prioritization

UNIT III: SECURE SOFTWARE ARCHITECTURE AND DESIGN **09 Hrs**

Introduction, Software Security Practices For Architecture and Design: Architectural Risk Analysis, Software Security Knowledge for Architecture and Design: Security Principles, Security Guidelines and Attack Patterns, Secure Coding and Testing: Code Analysis, Coding Practices, Software Security Testing.

UNIT IV: SECURITY AND COMPLEXITY: SYSTEM ASSEMBLY CHALLENGES **09Hrs**

Introduction, Security Failures, Functional and Attacker Perspectives for Security Analysis, System Complexity Drivers and Security: Wider Spectrum of Failures, Incremental and Evolutionary Development, Conflicting or Changing Goals Complex, Deep Technical Problem Complexity.

UNIT V: GOVERNANCE AND MANAGING FOR MORE SECURE SOFTWARE **09 Hrs**

Governance and security, adopting an enterprise software security framework, how much security is enough, Security and project management, Maturity of Practice.

TEXT BOOK:

1. Software Security Engineering: A Guide for Project Managers, Julia H. Allen, Pearson Education. (SEI Series in Software Engineering) 1st Edition, 2008.

REFERENCEBOOKS:

1. Jason Grembi, Secure Software Development: A Security Programmer's Guide, Cengage Learning,2008.

2. Richard Sinn, Software Security, Cengage Learning,1st Edition, 2007.

ADDITIONAL LEARNING RESOURCES:

https://www.slideshare.net/alidecker8/software-security-engineering
https://www.tutorialspoint.com/software_security engineering

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	3	-	-	-	-	-	-	-	-	-	3
CO2	3	3	-	-	-	-	-	-	-	-	-	-	-	-	3
CO3	2	3	-	-	-	-	-	-	-	-	-	-	-	-	3
CO4	1	2	-	3	-	-	-	-	-	-	-	-	-	-	2
CO5	2	3	-	-	3	-	-	-	-	-	-	-	-	-	2
CO6	2	3	-	-	-	2	-	3	-	-	-	-	-	-	2
Average	2	2.7	-	3	3	2	-	3	-	-	-	-	-	-	2.5
Level of correlation of the course	2	3	-	3	3	2	-	3	-	-	-	-	-	-	3

3-High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

L	T	P	C
-	-	3	1.5

20AIT02:AUTOMATA & COMPILER DESIGN LAB

COURSE OUTCOMES:

After completion of the course 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.

TEXTBOOKS:

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

REFERENCEBOOKS:

1. Modern Compiler construction in C, Andrew W.Appel Cambridge University Press. Compiler

Construction, LOUDEN, Cengage Learning.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**											**3**	**1**
CO2	**3**	**3**			**2**								**2**	
CO3	**3**												**2**	
CO4	**3**				**2**								**2**	
AVG	**3**	**2.5**			**2**								**2.25**	**1**
LOC	**3**	**3**			**2**								**2**	**1**

3-High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech II Semester (Common to CSE, IT, CSD, CSM, CSE (CS), CSE (AI), CSE (IOT))

L	T	P	C
-	-	3	1.5

20AIT05: SOFTWARE ENGINEERING LAB

Course Outcomes:

At the end of the course 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 tools for distributed computation.

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 ofthe system to be automated
4. Identify and analyze all the possible risks and its risk mitigation plan for the systemto be automated
5. Diagnose any risk using Ishikawa Diagram (Can be called as Fish Bone Diagram orCause& Effect Diagram)
6. Define Complete Project plan for the system to be automated using Microsoft ProjectTool
7. Define the Features, Vision, Business objectives, Business rules and stakeholders inthe vision document
8. Define the functional and non-functional requirements of the system to be automatedby using Use cases and document in SRS document
9. Develop a tool which can be used for quantification of all the non-functionalrequirements
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 byChidamber 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/

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**												**3**	**1**
CO2	**2**	**3**		**3**				3					**2**	**1**
CO3	**2**	**3**											**2**	**2**
CO4	**3**												**2**	**1**
CO5	**3**												**2**	
Average	**2.6**	**1**		**3**				**3**					**2.2**	**1.25**
Level of Correlation	**3**	**1**		**3**				**3**					**2**	**2**

3- High mapping 2-Medium Mapping 1- Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester (Common to CSE,IT,CSE(DS),CSE(AI &ML),CSE(CS))

L	T	P	C
-	-	3	1.5

20ACS25 :WEB TECHNOLOGIES LAB

COURSE OUTCOMES:

After completion of the course 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: 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:

12.Case studies:- Practice sessions on Node.js and AngularJS.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	**3**	**3**	**3**	**2**	**2**								**3**	
C02	**3**	**3**	**3**	**2**	**1**								**2**	**1**
C03	**3**	**3**	**3**										**3**	
Average	**3**	**3**	**3**	**2**	**1.5**								**2.66**	**1**
Level of Correlation	**3**	**3**	**3**	**2**	**2**								**3**	**1**

3 -High mapping *2-Medium Mapping* *1- Low Mapping*

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester- CSE(CS)

L	T	P	C
-	-	3	1.5

20ACC19:SYSTEM SECURITY LAB

Course Outcomes:

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

1. Implement POP and File Transfer TCP protocols for transfer data between Client and Server
2. Identify and Analyze different attacks in a network using ARP Watch and Snort Tool.
3. Apply Nessus Tool for scan Network vulnerabilities and IPSEC for providing IP Security.
4. Use NMAP Tool for Security Auditing and study logs in a network.
5. Work independently or in team to solve problems with effective communication.

LIST OF EXPERIMENTS

1. Write a C Program to implement Post Office Protocol (PoP) in LAN.
2. Write a program to create a file from the server to the client by using File transfer TCP Algorithm.
3. Demonstrate intrusion detection system (ids) using any tool (snort) and study the logs.
4. Write a program to detect ARP spoofing using open source tool ARPWATCH.
5. Implement the Nessus tool to scan the network for vulnerabilities
6. Demonstrate security vulnerabilities Set up IPSEC under LINUX.
7. Implement Encryption and Decryption by using CrypTool Software.
8. Implement Network Ping Sweeps Using Nmap tool
9. Determine the Password Policy by Guessing the Guest Account Password
10. Create a Proxy Server in Windows and Linux to share the Network Connectivity by its configuration.

TEXTBOOKS:

1. Rick Lehtinen, “Computer Security Basics “,O'Reilly Media, Second Edition, 2006.
2. Mark Rhodes-Ousley, “Information Security“, McGraw-Hill Obsorne Media, Second Edition, 2013.
3.JohnA.Vacca,” Network and System Security”,Syngress Edition,2010

Software Tools:

- Kali Linux Tools
- NESSUS

- NMAP
- CRYPTOTOOL
- ARP
- SNORT

Additional Learning Resources:

www.veracode.com/security/arp-spoofing

http://searchsecurity.techtarget.com/definition/IP-spoofing.

https://www.snort.org/

https://nmap.org/

https://www.itperfection.com/network-security/network-monitoring/what-is-nessus-and-how-does-it-work-network-munitoring-vulnerabilit-scaning-security-data-windows-unix-linux/

CO-PO Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	-	2	-	-	-	-	-	-	-	2	2	1
CO2	2	3	3	-	2	-	-	-	-	-	-	-	3	3	2
CO3	3	2	1	-	1	1	1	-	-	-	-	-	3	3	3
CO4	3	3	2	2	2	2	2	-	-	-	-	-	3	3	2
CO5	-	-	-	-	-	-	-	-	3	3	-	-	2	2	2
Average	2.8	2.5	2.5	2	1.7	1.5	1.5	-	3	3	-	-	2.6	2.6	2
Level of correlation of course	3	3	3	2	2	2	2	-	3	**3**	-	-	3	3	2

3 -High mapping *2-Medium Mapping* *1- Low Mapping*

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester –CSE(CS)

L	T	P	C
1	-	2	2

20ACC20 :PENTRATION TESTING
(Skill Course)

COURSE OUTCOMES

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

1. Analyze the usage of network tools for obtaining data in communication networks.
2. Analyze the performance of packets transmission on different filters using nikto tool.
3. Explore the different options in zaproxy tool to perform different activities like ping, fingerprinting.
4. Use sqlmap and medusa tools to secure data in social networks
5. Apply decision tree algorithms to detect network vulnerabilities using exploitation tools aircrack-ng, apktool, set, hamser

LIST OF EXPERIMENTS

Information Gathering

1. Implement Nmap tool to sniff the network and perform auditing on the security of system.
2. Implement following using Dmitry for information gathering on the network

a) subdomain search b)email-address search c)TCP Portscan

Vulnerability Analysis

3. Scan the website https://www.svec.education/ for any vulnerabilities using Nikto.

Web Application Analysis

4. Configure Zaproxy tool in Mozilla firefox and trace the browser traffic.

Database Assessment

5. Track the dictionary based attack on network using sqlmap

Password Attacks

6. Perform thread based parallel testing on a network using medusa.

Wireless Attacks

7. Implement standard FMS attack using aircrack-ng.

Reverse Engineering

8. Reverse the whole android application using apktool.

Exploitation tools

9. Implement spear-phishing attack using set

Sniffing and spoofing

10. Implement IP and MAC spoofing using Hamster

TEXTBOOKS:

1.Ric Messier, “Learning Kali Linux: Security Testing, Penetration Testing, and Ethical Hacking”,ShroffPubl&Dist Pvt Ltd, 2018

REFERENCEBOOKS:

1. Himanshu Sharma, “Kali Linux - An Ethical Hacker's Cookbook,” Packt Publishing Limited

ADDITIONAL LEARNING RESOURCES:

1.https://nptel.ac.in/courses/106/106/106106178/ ”Information Security “

2.https://www.coursera.org/courses?query=kali%20linux

SOFTWARES TOOLS:

1. Kali Linux tools likeNmap, Dmitry, Nikto, Zaproxy, SQLMap, Medusa, aircrack- bng, apktool, set, hamser

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

20AHS23:Essence of Indian Traditional Knowledge

COURSE OUTCOMES:

After completion of the Course, Student will be able to:

1. Identify various aspects of Traditional knowledge and its importance.
2 .Explain briefly to understand the needs and importance of protecting traditional knowledge.
3. Analyze the various systems, concepts and strategies of traditional knowledge.
4. 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:

1.Traditional Knowledge System in India, by Amit Jha, 2009.

REFERENCEBOOKS:

1.Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002.

2."Knowledge Traditions and Practices of India" Kapil Kapoor1, Michel Danino2.

Web Links:

1. https://www.youtube.com/watch?v=LZP1StpYEPM 2.http://nptel.ac.in/courses/121106003/

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

IV B.Tech I Semester

(Common to CE, EEE, ME, ECE, CSE, IT, CSE(DS),CSE(AI & ML),CSE(CS),CAI,CSE(IOT))

L	T	P	C
3	-	-	3

20AMB04:CREATIVITY AND INNOVATION

COURSE OUTCOMES:

After the completion of the course student will be able to

1. Explain innovation and creativity management from the perspective of obtaining a sustainable competitive advantage and integrating innovation into the business strategy.
2. Explain the attributes of successful innovation strategies including an in-depth understanding of the dynamics of innovation
3. Identify the role that innovation plays in the competitive dynamics of industries and how these innovations affect society.
4. Explain the factors and drivers that predict creativity and innovation of individuals, groups, and organizations
5. 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-Startupand Venture Development-Pre-incubation and Incubation Stages-Govt. Schemes and funding support to ideas, innovations, and startup-Current trends, development and generalawareness 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.). McGraw Hill India.
3. Lalitha Krishnamacharyulu.(2010).- Innovation Management, Himalaya PublishingHouse, 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.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1			2		2									
CO2			2		2									
CO3			2		2									
CO4			2		2									
CO5			2		-	2					2			
Average			2		2	2					2			
Level of correlation of the course			2		2	2					2			

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING ANDTECHNOLOGY
(Autonomous)

L	T	P	C
3	0	0	3

IV B.Tech I Semester (Common to CE, EEE, ME, ECE, CSE, IT, CSE (DS), CSE (AI & ML), CSE (CS), CAI, CSE (IOT))

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 anEffective Leader, Leadership as a Process - the Complexities of Leadership - Effective Leadership Behaviours and Attitudes –Emerging Approaches of leadership.

Unit II- Leadership and Power: Sources of Power, The link between Politics, Power andConflict, 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 leadersin organization.

TEXTBOOKS:

1. Peter Guy Northouse. (2021). Introduction to leadership : concepts and practice (5thed.). 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.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1											3			
CO2									3		3			
CO3											3			
CO4									3		3			
CO5									3		2			
Average									3		2.8			
Levelof orrelation									3		3			

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)

L	T	P	C
3	0	0	3

IV B.Tech I Semester (Common to CE, EEE, ME, ECE, CSE, IT, CSE (DS), CSE (AI & ML),CSE (CS),CAI,CSE(IOT))

20AMB06: LAW FOR ENGINEERS

COURSE OUTCOMES:

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

1. Explain the essential principles of the law relevant to engineering practice
2. Apply the relevant provisions of contract law
3. Use effective contract laws for decision making and problem-solving techniques indifferent scenarios
4. Recognize and explore key legal requirements for engineering including health &safety, privacy, and professional indemnity.
5. 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**

TEXTBOOKS:

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.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	3	-	-	-	-	-	-	-	-
CO2	-	-	-	3	-	3	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	3	-	-	-	-	3	-	-	-
CO4	-	-	-	-	-	3	-	-	-	-	3	-	-	-
CO5	-	-	-	-	-	3	-	-	-	-	2	-	-	-
Average	3	-	-	3	-	3	-	-	-	-	2.6	-		
Levelof orrelation	3	-	-	3	-	3	-	-	-	-	3	-	-	-

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

IV B.Tech I Semester

(Common to CE, EEE, ME, ECE, CSE, IT, CSE (AI&ML) CSE (DS) ,CAI, CSE(CS) & CSE(IOT))

L	T	P	C
3	-	-	3

20AMB07:ENTREPRENEURSHIP ESSENTIALS

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: AnEntrepreneurial 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 OnlyWay 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 andEngineers. United Kingdom: Pearson Prentice Hall.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1											3			
CO2											3			
CO3		1	1								3			
CO4		1	1								3			
CO5		1	1								3			
Average		1	1								3			
Level of correlation of the course		1	1								3			

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

L	T	P	C
3	0	0	3

IV B.Tech I Semester (Common to CE, EEE, ME, ECE, CSE, IT, CSE (DS),CSE(AI & ML),CSE(CS),CAI,CSE(IOT))

20AMB08: ESSENTIALS OF MANAGEMENT SCIENCE
(Common to All Branches)

COURSE OUTCOMES:

After completion of the course student will be able to

1. Apply various areas of functional management for the prospects of business organization.
2. Apply management principles for decision making.
3. Apply various functions of Hr manager.
4. Use tools and techniques to become an effective manager.
5. 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 andTheory 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 thEdition,2004.

3.PannerSelvem, Production and Operations Management, Prentice Hall of India,3 rdEdition, 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 PublishingHouse,2000

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1									3		3		3	3
CO2									3		3		2	1
CO3									3		3		2	2
CO4									3		3		3	2
CO5									3		3		2	2
Average									3		3		2.4	2
Level of Correlation									3		3		2	2

3-High Mapping 2- Medium Mapping 1-Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

	L	T	P	C
IV B.Tech I Semester- CSE (CS)	**3**	**0**	**0**	**3**

20ACC21: SECURE CODING PRACTICES

(Professional Elective -III)

COURSE OUTCOMES:

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

1. Understand the basics of secure programming.
2. Understand the most frequent programming errors leading tosoftware vulnerabilities.
3. Identify and analyze security problems in software
4. Understand and protect against security threats and softwarevulnerabilities
5. Apply knowledge to the construction of secure software systems

UNIT I: **9 Hrs**

Security, CIA Triad, Viruses, Trojans, and Worms In a Nutshell, Security Concepts- exploit, threat, vulnerability, risk, attack. Malware Terminology: Rootkits, Trapdoors, Botnets, Key loggers, Honeypots. Active and Passive Security Attacks. IP Spoofing, Tear drop,DoS, DDoS,XSS, SQL injection, Smurf, Man in middle, Format String attack. Types of Security Vulnerabilities- buffer overflows, Invalidated input, race conditions, access-control problems, weaknesses in authentication,

UNIT II: **9 Hrs**

Need for secure systems: Proactive Security development process, Secure Software Development Cycle (S-SDLC), Security issues while writing SRS, Design phase security, Development Phase, Test Phase, Maintenance Phase, Writing Secure Code — Best Practices SD3 (Secure by design, default and deployment), Security principles and Secure Product Development Timeline.

UNIT III: **9 Hrs**

Threat modelling process and its benefits: Identifying the Threats by Using Attack Trees andrating threats using DREAD, Risk Mitigation Techniques and Security Best Practices. Security techniques, authentication, authorization. Defence in Depth and Principle of Least Privilege.

UNIT IV: **9 Hrs**

eSecure Coding Techniques: Protection against DoS attacks, Application Failure Attacks, CPU Starvation Attacks, Insecure Coding Practices In Java Technology. ARP Spoofing and its countermeasures. Buffer Overrun- Stack overrun, Heap Overrun, Array Indexing Errors,FormatString Bugs. Security Issues in C Language: String Handling, Avoiding Integer Overflows and Underflows and Type Conversion Issues- Memory Management Issues.

UNIT V: **9 Hrs**

Database and Web-specific issues: SQL Injection Techniques and Remedies,Race conditions,Time of

Check Versus Time of Use and its protection mechanisms. Validating Input and Interprocess Communication, Securing Signal Handlers and File Operations. XSS scripting attack and its types — Persistent and Non persistent attack XSS Countermeasures and Bypassing the XSS Filters.

TEXT BOOKS:

1. Writing Secure Code, Michael Howard and David LeBlanc,Microsoft Press.
2. Buffer Overflow Attacks: Detect, Exploit, Prevent by Jason Deckar,Syngress.
   Threat Modeling, Frank Swiderski and Window Snyder,Microsoft Professional

REFERENCE BOOKS:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	2	3	-	-	-	-	-	-	-	-	3	-	
CO2	2	3	1	-	-	-	-	-	-	-	-	-		-	3
CO3	1	3	1	3	-	-	-	-	-	-	-	-	3	2	
CO4	1	1	1	-	-	-	2	2	-	-	-	-	3	-	
CO5	1	1	3							3				3	
Average	1.8	1.8	1.6	3									3	2.5	3
Level of Correlation	2	2	2	3									3	3	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

L	T	P	C
3	0	0	3

IV B.Tech I Semester- CSE (CS)

20ACC22: NETWORK DEFENSE

(Professional Elective -III)

COURSE OUTCOMES:

After completion of the course student will be able to

1. Discuss a wide range of network attacks.
2. Apply risk assessment techniques related to security threats.
3. Identify network attacks (denial of service, flooding, sniffing and traffic redirection, inside attacks, etc.) and basic network defense tools.
4. Identify various types of malicious software and use countermeasure defense/detection tools.

UNIT – I **5 hrs**

Network Security Threats, Attacks, and Vulnerabilities Using Layered Defense Strategy: defense in depth.

UNIT – II **9 hrs**

Attack Classification and Examples of Attacks. Risk Analysis: threat and risk assessment, economic impacts, techniques for minimizing risk. Security Policy Creation: security policy lifecycle, security policy development and best practices, handling security incidents (response team, responding procedures, etc.), business continuity.

UNIT – III **9 hrs**

Network Attacks Landscape: network reconnaissance, attack techniques, malicious code, countermeasures Analysis of Network Traffic: CVE identifiers, signature and traffic analysis, identification of suspicious events. Web and Internet Resources: hardening DNS servers, Web Servers, Routers

UNIT – IV **8 hrs**

Hardening Operating Systems: configuring properly Windows, Unix, Android, patching. Network Defensing Technology: Intrusion Detection and Prevention Systems, Firewalls, VPN, Proxy Servers, Honeypots, Antivirus, etc.

UNIT – V **10 hrs**

Security Management and Standards. Security in the System Development Lifecycle: Initiation Phase (security categorization),Development and Acquisition Phase (risk assessment, security functional requirements analysis, security plan), Implementation Phase (technology best practices, security control testing plan), Maintenance Phase (continuous monitoring plan).

TEXTBOOK :

1.Guide to Network Defense and Countermeasures, Third edition Randy Weaver, Dawn Weaver, Dean Farwood – Cengage Learning 2013 ISBN – 1133727948.

2.Network Defense and Countermeasures: Principles and Practices, Second Edition, William (Chuck) Easttom, II, Pearson IT Certification 2014 ISBN – 0789750945

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2											3		
CO2	2	2	2	3										2	3
CO3	3	3											3		
CO4		2	2										3		3
Average	2	2.25	2	3									3	2	3
Level of Correlation	2	2	2	3									3	2	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

L	T	P	C
3	0	0	3

IV B.Tech I Semester- CSE (CS)

20ACC23: SECURITY AND PRIVACY IN CLOUD

(Professional Elective -III)

COURSE OUTCOMES:

After completion of the course student will be able to

1. Comprehend the basics of cloud platforms and risk issues in cloud computing.
2. Describe cloud security architecture, challenges and requirements.
3. Understand the functionalities of security protocols.
4. Identifying best practices and strategies for a secure cloud environment
5. Analyze to perform security analytics in cloud platform.

UNIT: I INTRODUCTION **6 Hrs**

Review of cloud platforms and architectures Security issues from the cloud providers perspective, users perspective Understanding security and privacy - Cloud Computing risk issues.

UNIT: II SECURING THE CLOUD **5 Hrs**

Security challenges Security requirements for the architecture - Securing private and public clouds Security patterns Cloud security architecture Infrastructure security.

UNIT: III SECURITY Protocols and Standards **8 Hrs**

Host security, Compromise response, Security standards Message Level Security (MLS), Transport Level Security, OAuth, OpenID, extensible Access Control Mark-up Language (XACML), and Security Assertion Mark-up Language (SAML).

UNIT: IV STRATEGIES AND PRACTICES **8 Hrs**

Strategies and best practices Security controls: limits, best practices, monitor Security criteria - assessing risk factors in Clouds. Security management in the cloud 4 Hrs Security management in the cloud: SaaS, PaaS, IaaS availability management Security as a service Trust Management for Security.

UNIT: V SECURITY ANALYTICS **7 Hrs**

Techniques in Analytics - Challenges in Intrusion Detection System and Incident Identification DDoS attacks Analytics - Analysis of Log file - Simulation and Security Process.

TEXT BOOK:

1. Ronald L. Krutz , Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud computing, Wiley 2010 Securing the Cloud: Cloud Computer Security Techniques and Tactics, by Vic (J.R) Winkler, Elseiver 2011

REFERENCE BOOKS:

1. Ben Halpert , Auditing Cloud Computing: A Security and Privacy Guide: , John Wiley Sons, 2011. Ianlim, E.Coleen Coolidge, Paul Hourani, Securing Cloud and Mobility: A Practitioners Guide, Auerbach Publications, Feb 2013. Pethuru Raj, Cloud Enterprise Architecture, CRC Press, 2013. Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar Mode of assessment: Recommended by Board of Studies 13.05.2016 Approved by Academic Council No. 41 Date 17.06.2016

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3											3		1
CO2	2	2		3										2	
CO3	3	2		2									3		1
CO4	2	2		2									3		
CO5	3												2		
Average	2.6	2.25		2.33									2.75	2	1
Level Of Correlation	3	2		2									3	2	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

L	T	P	C
3	0	0	3

IV B.Tech I Semester –CSE (CS)

20ACC24: BIOMETRIC SECURITY

(Professional Elective -III)

Course Outcomes:

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

1. Understand the principles and concepts in biometric security.
2. Identify essential components required for the automation of fingerprint searching and matching in biometrics.
3. Select suitable feature encoding techniques and frameworks for iris recognition.
4. Analyze the performance of statistical and mathematical algorithms for facial recognition.
5. Apply suitable factors and measures for one speaker and two speaker detection in multimodal evaluation.

UNIT I: INTRODUCTION (07 periods)

An Introduction to Biometric Authentication Systems, a Quick Historical Overview, "Best" Biometric Characteristic, Applications, Taxonomy of Uses, Taxonomy of Application Environments, a System Model, Biometrics and Privacy.

UNIT II: FINGERPRINT IDENTIFICATION (09 periods)

Early Biometric Efforts, Applications of Fingerprints, Early Systems, Early Automation Efforts, the Technology, Criminal Applications, Civil Applications, Commercial Applications.

UNIT III: IRIS RECOGNITION (10 periods)

Physical and Behavioral Biometrics, Iris and the Retina, Physiology of the Retina, Process of Retinal Recognition, Advantages and Disadvantages, Physiological Structure of the Iris, Framework of Iris Recognition: Mathematical algorithms, Image acquisition;
Segmentation; Normalization; Feature encoding; Feature matching, Reducing the Effects of Pupil Dilation and Constriction, Reducing the Effects of Eyelids and Eyelashes, Reducing the Signal Noise in the Eye Image.

UNIT IV: FACE RECOGNITION (10 periods)

An Introduction to Facial Recognition, Techniques of Facial Recognition, Advantages and Disadvantages, Various Approaches to Facial Recognition, Statistical Algorithms of Facial Recognition, Mathematical Algorithms, Applications and its Limitations.

UNIT V: SPEAKER RECOGNITION (09 periods)

Introduction, NIST Speaker Recognition Evaluation Tasks: One-Speaker Detection, Two-Speaker Detection, Speaker Tracking, Speaker Segmentation, Speaker Training, Test Segments, Performance Measure, Factors Affecting Detection Performance, Extended Data Evaluation, Multimodal Evaluation.

Total Periods: 45

TEXT BOOKS:

1. James Wayman, Anil Jain, DavideMaltoni and Dario Maio, "Biometric Systems Technology, Design and Performance Evaluation", Springer, 2011.
2. Ravindra Das, "The Science of Biometrics Security Technology for Identity Verification", First Edition, Routledge Publisher, 2019.

REFERENCE BOOKS:

1. John Chirillo and Scott Blaul, "Implementing Biometric Security", First Edition, John Wiley & Sons 2003.

Mapping:

	PO1	*PO2*	*PO3*	*PO4*	*PO5*	*PO6*	*PO7*	*PO8*	*PO9*	*PO10*	*PO11*	*PO12*	*PSO1*	*PSO2*	*PSO3*
CO1	3	-	-	-	-	-	1	-	-	-	-	-	3	2	1
CO2	3	3	1	2	1	-	1	-	-	-	-	-	3	1	1
CO3	3	3	1	2	2	-	1	-	-	-	-	-	3	2	1
CO4	3	3	1	2	2	-	1	-	-	-	-	-	3	2	1
CO5	3	2	-	3	1	-	1	-	-	-	-	-	3	2	1
Average	3	2.6	1	2.25	1.5	-	1	-	-	-	-	-	3	2	1
Level of correlation of the course	3	3	1	3	2	-	1	-	-	-	-	-	3	2	1

Level of Correlation: 3 - High 2 - Medium 1 – Low

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

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L	T	P	C
3	0	0	3

IV B.Tech I Semester- CSE (CS)

20ACC25: USER INTERFACE DESIGN

(Professional Elective -III)

COURSE OUTCOMES:

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

1. Analyze the user requirements, technological and physical characteristics of users for better interface design
2. Analyze desktop and mobile applications by applying various user interface design methods
3. Analyze the usability of user-interfaces using qualitative Nielsen's guidelines and testing methodologies
4. Identify interaction and navigation styles to model the user interfaces
5. Apply speech recognition, command languages, collaboration models to find the design consistency in user interfaces
6. Analyze search interfaces by applying five stage framework for effective data visualization

UNIT I: USABILITY OF INTERACTIVE SYSTEMS (09 Hrs)

Usability Goals and Measures, Usability Motivations Universal Usability:Variations in Physical Abilities and Physical Workplaces, Diverse Cognitive and Perceptual Abilities, Personality Differences, Cultural and International Diversity, Users with Disabilities, Older Adult Users, Children, Accommodating Hardware and Software Diversity

UNIT II: DESIGN PROCESSES AND USER EXPERIENCE (09 Hrs)

Organizational Support for Design, the Design Process, Design Frameworks, Design Methods, Design Tools, Practices, and Patterns, Social Impact Analysis, Legal Issues

Evaluation and the User Experience: Expert Reviews and Heuristics, Usability Testing and Laboratories, Survey Instruments, Acceptance Tests, Evaluation during Active Use and Beyond, Controlled Psychologically Oriented Experiments

UNIT III: INTERACTION STYLES (09 Hrs)

Direct Manipulation and immersive Environments:2-D and 3-D Interfaces, Teleoperation and Presence, Augmented and Virtual Reality

Fluid Navigation: Navigation by Selection, Small Displays, Content Organization, Audio Menus, Form Fill-in and Dialog Boxes.

Case Study: Iterative Design Evaluation of Automated Teller Machines (ATMs)

UNIT IV: EXPRESSIVE HUMAN AND COMMAND LANGUAGES (09 Hrs)

Speech Recognition, Speech Production, Human Language Technology, Traditional Command Languages

Device: Keyboards and Keypads, Pointing Devices, Displays

Communication and Collaboration: Models of Collaboration, Specific Goals and Contexts, Design Considerations

UNIT V: INFORMATION SEARCH AND DATA VISUALIZATION (09 Hrs)

Five-Stage Search Framework, Dynamic Queries and Faceted Search, Command Languages and "Natural" Language Queries, Multimedia Document Search and Other Specialized Search, the Social Aspects of Search Data Visualization: Tasks in Data Visualization, Visualization by Data Type, Visualization by Data Type, Challenges for Data Visualization

TEXT BOOK:

1. Schneiderman, Plaisant, Cohen, Jacobs, Elmqvist, *Designing the User Interface*, Pearson Education, 6th Edition, 2018.

REFERENCE BOOKS:

1. A Dix, Janet Finlay, G. D. Abowd and R. Beale, *Human- Computer Interaction*, Pearson Publishers, 3rd Edition, 2008.
2. Jonathan Wolpaw and Elizabeth Winter Wolpaw, *Brain-Computer Interfaces: Principles and Practice*, Oxford Publishers, 2012.

ADDITIONAL LEARNING RESOURCES

1. https://nptel.ac.in/courses/106103115/

CO-PO and PSO Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	-	-	-	-	-	-	-	-	-	-	1	2	2
CO2	2	3	2	-	2	-	-	-	-	-	-	-	2	3	2
CO3	2	3	1	2	1	-	-	-	-	-	-	-	1	2	1
CO4	3	3	2	1	2	-	-	-	-	-	-	-	2	3	2
CO5	3	3	2	1	2	-	-	-	-	-	-	-	3	2	-
CO6	2	3	1	2	1	-	-	-	-	-	-	-	-	3	-
Average	2.3	3	1.6	1.5	1.6								1	2	2
Level of correlation of the course	2	3	2	2	2	-	-	-	-	-	-	-	2	3	2

Correlation Level: 3 - High 2 - Medium 1 – Low

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

	L	T	P	C
IV B.Tech I Semester- CSE (CS)	**3**	**0**	**0**	**3**

20ACC26: WEB APPLICATION SECURITY

(Professional Elective -IV)

COURSE OUTCOMES:

After the completion of course the student will be able to

1. Identify the vulnerabilities in the web applications.
2. Identify the various types of threats and mitigation measures of web applications.
3. Apply the security principles in developing a reliable web application.
4. Use industry standard tools for web application security.
5. Apply penetration testing to improve the security of web applications.

UNIT:1 **OVERVIEW OF WEB APPLICATIONS & WEB APPLICATION SECURITY FUNDAMENTALS** **9 Hrs**

Introduction history of web applications interface ad structure benefits and drawbacks of web applications Web application Vs Cloud application. Security Fundamentals: Input Validation - Attack Surface Reduction Rules of Thumb- Classi- fying andPrioritizing Threads

UNIT:2 **BROWSER SECURITY PRINCIPLES** **9 Hrs**

Origin Policy - Exceptions to the Same-Origin Policy - Cross-Site Scripting and Cross-Site Request Forgery - Reflected XSS - HTML Injection

UNIT:3 **WEB APPLICATION VULNERABILITIES** **9 Hrs**

Understanding vulnerabilities in traditional client server application and web applications, client state manipulation, cookie based attacks, SQL injection, cross domain attack (XSS/XSRF/XSSI) http header injection. SSL vulnerabilities and testing - Proper encryption use in web application

- Session vulnerabilities and testing - Cross-site request forgery

UNIT:4 **WEB APPLICATION MITIGATIONS** **9 Hrs**

Http request , http response, rendering and events , html image tags, image tag security, issue, java script onerror , Javascript timing , port scanning , remote scripting , running remotecode, frame and iframe , browsersandbox, policy goals, same origin policy, library import, domain relaxation

UNIT:5 **SECURE WEBSITE DESIGN** **9Hrs**

Secure website design : Architecture and Design Issues for Web Applications, Deployment Con- siderations Input Validation, Authentication, Authorization, Configuration Management ,Sen- sitive

Data, Session Management, Cryptography, Parameter Manipulation, Exception Manage- ment, Auditing and Logging, Design Guidelines, Forms and validity, Technical implementation

TEXT BOOKS:

1.Sullivan, Bryan, and Vincent Liu. Web Application Security, A Beginner's Guide. McGraw Hill Profe ssional, 2011.

2.Stuttard, Dafydd, and Marcus Pinto. The Web Application Hacker's Handbook: Finding and Exploiting Security Flaws. John Wiley Sons, 2011

Mapping:

	PO1	***PO2***	***PO3***	***PO4***	***PO5***	***PO6***	***PO7***	***PO8***	***PO9***	***PO10***	***PO11***	***PO12***	***PSO1***	***PSO2***	***PSO3***
CO1	2	3	1	2	2	-	-	-	-	-	-	-	3	-	3
CO2	2	3	2	2	3	-	-	-	-	-	-	-	-	3	3
CO3	2	3	2	2	3	-	-	-	-	-	-	-	3	2	3
CO4	-	2	2	2	3	-	-	-	-	-	-	-	-	2	3
CO5	2	2	3	2	3	-	-	-	-	-	-	-	2	2	-
Average	2	2.6	2	2	2.8								2.66	2.25	3
Level of Correlation	2	3	2	2	3								3	2	3

Correlation Level: 3 - High 2 - Medium 1 – Low

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IV B.Tech I Semester- CSE (CS)

20ACS86: SECURITY ASSESSMENT AND RISK ANALYSIS

(Professional Elective IV)

COURSE OUTCOMES:

After the completion of course the student will be able to

1. Design information security risk management framework and methodologies
2. Identify and modelling information security risks
3. Judge the difference between qualitative and quantitative risk assessment methods

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, riskassessment), cost/benefit analysis of controls, implementation of cost effective controls, monitoringthe 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

Mapping:

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	*PO2*	*PO3*	*PO4*	*PO5*	*PO6*	*PO7*	*PO8*	*PO9*	*PO10*	*PO11*	*PO12*	*PSO1*	*PSO2*	*PSO3*
CO1	2	3	3	2	2	-	-	-	-	-	-	-	2	2	2
CO2	3	3	2	1	2	-	-	-	-	-	-	-	1	2	-
CO3	3	3	1	1	3	-	-	-	-	-	-	-	3	2	1

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IV B.Tech I Semester -CSE (CS)

20ACC27: CYBER SPACE OPERATIONS AND DESIGN

(Professional Elective -IV)

COURSE OUTCOMES:

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

1. Explain the Concept of Cyberspace Environment and Design.
2. List all the Cyberspace Operational Approaches.
3. Outline the cyberspace operation and integrate it with a Joint Operations plan.
4. Build Cyber Warriors and Warrior Corps
5. Designing Cyber Related Commands and Organizational structures.

UNIT–I **7 hrs**

Understanding the Cyberspace Environment and Design- Cyberspace environment and its characteristics, developing a design approach, planning for cyberspace operation.

UNIT–II **10 hrs**

Cyberspace Operational Approaches- Foundational approaches that utilize cyberspace capabilities to support organizational missions, the pros and cons of the different approaches.

Cyberspace Operations- Network Operations (NETOPS), Defensive Cyberspace Operations (DCO), Offensive Cyberspace Operations (OCO), Defence and Diversity of Depth network design, Operational methodologies to conduct cyberspace operations.

UNIT–III **8 hrs**

Cyberspace Integration- Design a cyberspace operation and integrate it with a Joint Operations plan, Practice the presented methodologies in a practical application exercise.

UNIT–IV **8 hrs**

Building Cyber Warriors and Warrior Corps- The warrior and warrior corps concept as applied to cyber organizations, the challenges of training and developing a cyberworkforce from senior leadership to the technical workforce.

UNIT–V **9 hrs**

Designing Cyber Related Commands- Mission statements, Essential tasks, Organizational structures, Tables of organizations. **Training and Readiness for Cyber Related Commands-** Mission Essential Tasks (METs), Developing the cyber workforce, Plan your own training programs within your organization

TEXT BOOKS:

1. Paulo Shakarian et al. ―Introduction of Cyber Warfare: A Multidisciplinary Approach,‖syngress, Elsevier 2013.

2. Jeffery carr et al, ―Inside Cyber Warfare: Mapping the Cyber Underworld,‖ O'Reilly Publication December 2012.

REFERENCE BOOKS:

1. Paulo Shakarian et al. ―Introduction of Cyber Warfare: A Multidisciplinary Approach,‖syngress, Elsevier 2013.

2. Jason Andress et al. ―Cyber Warfare: Techniques, Tactics and Tools for Security Practitioners‖ Syngress, Elsevier 2013.

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IV B.Tech I Semester-CSE (CS)

20ACC28: SOFTWARE ARCHITECTURE AND DESIGN PATTERNS
(Professional Elective -IV)

COURSE OUTCOMES: *After completion of this course, the students will be able to:*

1. Identify the early designs of a software project based on knowledge in software architecture, styles, patterns and frameworks.
2. Analyze and select appropriate architectural patterns for designing of a software.
3. Select appropriate Architectural Style techniques for designing and evaluating a system's architecture.
4. Design appropriate software architectures using Architecture Design Guidance for software Project implementation.
5. Design Architectural solutions using Formal Models and Specification.
6. Apply design patterns for providing solutions to recurring problems in software design

DETAILED SYLLABUS

UNIT I: INTRODUCTION TO SOFTWARE ARCHITECTURE (09 Hrs)

Software Architecture, Software as Engineering Discipline, the Status of Software Architecture, Designing the Architecture, Documenting Architecture, Reconstructing Software Architecture. Software Architecture Guidelines, Baseline architecture, Good software architecture.

UNIT II: ARCHITECTURALSTYLES (09 Hrs)

Pipes And Filters, Data Abstraction And Object Oriented Organization, Event-Based Implicit Invocation, Layered Systems, Repositories, Interpreters, Process Control, Familiar Architectures, Heterogeneous Architectures.

UNIT III: ARCHITECTURE DESIGN GUIDANCE AND FORMAL MODELSSPECIFICATION

(09 Hrs)

Database Integration, Batch Sequential, Simple Repository, Virtual Repository, Hierarchical Repository, Integration in Software Development Environments, Guidance for User Interfacing Architecture, Architectural Structures for Shared Information Systems, Formalizing the Architecture of a Specific System, Formalizing an Architectural Style, Formalizing Architectural Design Space, Case Study of an Industry Standard Computing Infrastructure: J2EE\EJB.

UNIT IV: DESIGN PATTERNS AND CREATIONAL PATTERNS (09 Hrs)

Design Pattern, Small talk MVC, Catalogs, Role in Solving Design Problems, Selecting Design Pattern, Using Design Pattern. Creational Patterns: Abstract Factory, Prototype.

UNIT V: STRUCTURALPATTERNS ANDBEHAVIORALPATTERNS (09 Hrs)

Structural Patterns: Adapter, Bridge, Composite. Behavioral Patterns**:** Proxy, Interpreter, Iterator.

TEXT BOOKS:

1. Mary Shaw, David Garlan, *Software Architecture Perspective: onan Emerging Discipline*, PHI, 2014.
2. Erich Gamma, *Design Patterns*, Pearson Education, 2006.

REFERENCE BOOKS:

1. Len Bass, Paul Elements, Rick Kazman, *Software Architecture in Practice*, SEI Series,2012
2. Busch mann, *Pattern Oriented Software Architecture*, Wiley, 1996.
3. Gamma,Shaw,*AnIntroductiontoSoftwareArchitecture*, World Scientific,1995

ADDITIONAL LEARNING RESOURCES:

- https://www.coursera.org/learn/software-architecture
- https://www.coursera.org/learn/design-patterns

CO-PO-PSO Mapping Table:

	PO1	***PO2***	***PO3***	***PO4***	***PO5***	***PO6***	***PO7***	***PO8***	***PO9***	***PO10***	***PO11***	***PO12***	***PSO1***	***PSO2***	***PSO3***
CO1	3	3	2	-		-	-	-	-	-	2	-	2	3	1
CO2	3	3	3	-	1	-	-	-	-	-	-	-	2	3	-
CO3	3	1	3	1	1	-	-	-	-	-	1	-	-	2	2
CO4	3	2	3	-	3	-	-	-	-	-	-	-	2	3	2
CO5	3	2	1	-	1	-	-	-	-	-	-	-	3	-	-
Average	3	2.5	2.6	1	1.5	-	-	-	-	-	1.5	-	3	2	-
Level of correlation of the course	3	3	3	1	2	-	-	-	-	-	2	-	2	3	1

Correlation Level: 3- High 2-Medium 1- Low

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IV B.Tech I Semester –CSE (CS)

20ACC29: DECISION SUPPORT AND INTELLIGENT SYSTEMS

(Professional Elective -IV)

COURSE OUTCOMES:

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

1. Understand phases of management support and decision making systems.
2. Develop efficient decision support systems by choosing appropriate decision support system models.
3. Understand collaborative computing technologies, enterprise information systems and knowledge management for making Decision Support Systems.
4. Apply Artificial Intelligence, Machine Learning and Genetics Algorithms for decision making.
5. Understand Management Support Systems in E-Business, E-Commerce, L-Commerce, Intra-business, Legal and Ethical Issues in E-commerce.

UNIT I– DECISION MAKING AND COMPUTERIZED SUPPORT 09 Hrs

Management support systems: Managers and Decision-Making ,Managerial Decision-Making and Information Systems ,Managers and Computer Support, Computerized Decision Support and the Supporting Technologies, A Framework for Decision Support ,The Concept of Decision Support Systems, Group Support Systems ,Enterprise Information System, Knowledge Management Systems, Expert Systems, **Decision making systems modeling- support**: Phases of decision Making Process.

UNIT II – DECISION SUPPORT SYSTEMS 09 Hrs

Decision Support Systems: DSS Configurations, Characteristics and Capabilities of DSS, Components of DSS, The User, DSS Hardware, DSS Classifications. **Modeling and Analysis**: MSS Modeling, Static and Dynamic Models, Certainty, Uncertainty, and Risk. Decision Analysis of a Few Alternatives (Decision Tables and Decision Trees), The Structure of MSS Mathematical Models. **Decision Support System Development:**The Traditional System Development Life Cycle, Alternative Development Methodologies.

UNIT III– COLLABORATIVE COMPUTING TECHNOLOGIES 09 Hrs

Collaborative Computing Technologies: Group Support Systems, Group Decision-Making, Communication and Collaboration, Communication Support, Group Support Systems, Group Support Systems Technologies, Group systems Meetingroom and Online, The GSS Meeting Process. **Enterprise Information Systems:**Concepts and Definitions,The Evolution of Executive and Enterprise Information Systems, Excecutive Roles and Information Needs

UNIT IV – INTELLIGENT DECISION SUPPORT SYSTEMS **09 Hrs**

Artificial Intelligence and Expert Systems: Concepts and Definitions of Artificial Intelligence, Evolution of Artificial Intelligence, The Artificial Intelligence Field, Basic Concepts of Expert Systems, Applications of Expert Systems, Structure of Expert Systems. **Knowledge Acquisition, Representation & Reasoning:** Methods of Knowledge Acquisition from Experts, Knowledge Verification and Validation, Representation of Knowledge, Reasoning in Rule-Based Systems.

UNIT V – IMPLEMENTING MSS IN THE E-BUSINESS ERA **09 Hrs**

Implementing MSS in the E-Business ERA: E-Commerce Mechanisms: Auctions and Portals, Business-to-Consumer Applications, Market Research, e-CRM, and Online Advertising, Intrabusiness, Business-to-Employees, and People-to-People, E-Government, E-Learning, and Customer-to-Customer EC, M-Commerce, L-Commerce, and Pervasive Computing, Legal and Ethical Issues in E-Commerce.

TEXT BOOK:

1. Efraim Turban, Jay E Aronson and Ting-Peng Liang, *Decision Support Systems and Intelligent Systems*, Prentice Hall India, Seventh Edition, 2007.

REFERENCE BOOKS:

1. V. S. Janakiraman and K. Sarukesi, *Decision Support Systems*, PHI Learning, First Edition, 2009.

2. Efrem G Mallach, *Decision Support Systems and Data Warehouse Systems*, McGraw Hill, 2008.

ADDITIONAL LEARNING RESOURCES:

1. Knowledge based Decision Support Systems - https://repository.up.ac.za/bitstream/handle/2263/22959/02Chapter2.pdf
2. https://www.csie.ntu.edu.tw/~sylee/courses/ai/kbdss/L17%20-20Knowledge%20Engineering.pps

CO-PO and PSO Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	3
CO2	2	2	3	-	2	-	-	-	-	-	-	-	-	2	3
CO3	3	-	-	-	-	-	-	-	-	-	-	-	1	3	2
CO4	2	2	3	-	2	1	-	-	-	-	-	-	2	3	2
CO5	3	-	-	-	-	-	-	-	-	-	2	-	2	2	3
Average	2.6	2	3	-	2	1	-	-	-	-	2	-	-	-	3
Level of correlation of the course	3	2	3		2	1	-	-	-	-	2	-	-	2	3

Correlation Level: 3 - High 2 - Medium 1 – Low

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

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3	0	0	3

IV B.Tech I Semester-CSE (CS)

20ACC30: CYBER FORENSICS

(Professional Elective -V)

COURSE OUTCOMES

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

1. Understand the need for investigation and the ethics of investigation
2. Classify evidence and understand quality control procedures
3. Demonstrate the acquisition of data in different file systems
4. Infer and conduct basic Network forensic analysis and perform e-mail investigation
5. Make use of forensic tools and perform various tasks with the help of tools.

UNIT I INTRODUCTION 9 Hrs

Introduction to Forensics-Elements of crime, Knowledge base needed for cyber forensics, The law and Cyber forensics, **The Investigative Process**-Code of Ethics, Ethics of Investigations, The Evidence, **Evidence Management**- Collection, Transport, Storage, access control, disposition.

UNIT-II FORENSIC SCIENCE 9 Hrs

Principles and Methods: Scientific approach to Forensics, Identification and Classification of Evidence, **Location of Evidence**: Storage Media, Hard drives,Hardware Interfaces, Recovering Data, Media File Forensic Steps-**Forensic Analysis**: Planning, Case Notes and Reports, Quality Control.

UNIT III DATA ACQUISITION 9 Hrs

Windows and CLI Systems: File systems, Disk Drives, Solid-State storage devices-**File Structures**: Disk partitions, FAT disk, NTFS disk: MFT and File attributes, MFT structure for File data, Deleting NTFS files, Resilient file system- Windows Registry- Microsoft startup tasks-Virtual machines.

UNIT IV NETWORK FORENSICS 9 Hrs

Network forensics overview-Securing a Network- Developing procedures for network forensics-Investigating virtual networks-Examining Honeynet projects-**E-mail Investigations**: Role of client and server in E-mail, Investigating E-mail crimes and violations, E-mail Servers, E-mail Forensic tools.

UNIT V FORENSICS TOOLS **9 Hrs**

Evaluating Forensics Tool Needs- Tasks performed by forensics tools- **Forensics Software Tools**: Command-line forensic tools, Linux forensic tools- **Forensics Hardware Tools**: Forensic work station, Write-Blocker- Validating and TestingForensics Software

TEXT BOOKS:

1.Chuck Eastom, ,Certified Cyber Forensics Professional Certification, McGrawHill, July, 2017. [Unit 1 and 2]

2.Bill Nelson, Amelia Phillips and Chris Steuart, ,Guide to Computer Forensicsand Investigations', Cengage Learning, 6th edition, 2019. [Unit 3,4 and 5]

ONLINE RESOURCES

1.Rochester Institute of Technology 'Computer Forensics' *Online+ Available: {HYPERLINK "https://www.edx.org/course/computer-forensics-3"} [Accessed22 May 2019]

Mapping:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2		2	3	1	1		2							
CO2	2	1		1										2	
CO3	3	2		3								2	3		1
CO4	1	2	1	3	1	2								2	2
CO5	2		2		2	2						1	2	2	2

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L	T	P	C
3	0	0	3

IV B.Tech I Semester-CSE (CS)

20ACC31: INFORMATION SECURITY MANAGEMENT

(Professional Elective -V)

COURSE OUTCOMES:

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

1. Understand the security Management Principles and analyze risk management.
2. Apply access control Techniques to authentication applications.
3. Understand the Physical security principles and secure architectural design.
4. Analyze the implications of security and different laws.

UNIT – I INFORMATION SECURITY AND RISK MANAGEMENT 9 HRS

Security Management Concepts and Principles - Integrated Threat Management -Understanding Information Security Management Systems - Policies, Standards, Procedures, and Guidelines - Planning for a Privacy Breach, Risk Management- Using Quasi-Intelligence Resources to Protect the Enterprise - Information Risk Management: A Process Approach to Risk Diagnosis and Treatment

UNIT – II ACCESS CONTROL & CRYPTOGRAPHY 8 HRS

Access Control Techniques - Authentication Tokens, Authentication and the Role of Tokens Access Control Administration-Accountability Methods of Attack-Rootkits: The Ultimate Malware Threat. Encryption Key Management in Large-Scale Network Deployments.

UNIT – III PHYSICAL SECURITY & SECURITY ARCHITECTURE AND DESIGN 8 HRS

Elements of Physical Security, Principles of Computer and Network Organizations, Architectures, and Designs - Service-Oriented Architecture and Web Services Security, Analysis of Covert Channels, Security Frameworks.

UNIT – IV NETWORK SECURITY 7 HRS

Communications and Network Security - Facsimile Security Internet, Intranet, and Extranet Security -Network Content Filtering and Leak Prevention Network Attacks and Countermeasures.

UNIT – V APPLICATION SECURITY & LEGAL, REGULATIONS, COMPLIANCE, AND INVESTIGATION 10 HRS

Application Issues -Information Technology Infrastructure Library and Security Management Overview, Quantum Computing: Implications for Security.

Information Law- Compliance Assurance: Taming the Beast, Incident Handling- Enterprise Incident Response and Digital Evidence Management and Handling, Security Information Management Myths and Facts.

TEXT BOOK :

1.Information Security Management Handbook Sixth Edition VOLUME 2 Harold F. Tipton, CISSP . Micki Krause, CISSP – Auerbach Publications, Newyork.

Mapping:

	PO1	***PO2***	***PO3***	***PO4***	***PO5***	***PO6***	***PO7***	***PO8***	***PO9***	***PO10***	***PO11***	***PO12***	***PSO1***	***PSO2***	***PSO3***
CO1	-	3	2	-		-	-	-	-	-	2	-	2	3	1
CO2	2	-	3	2	3	-	-	-	-	-	-	-	2	3	-
CO3	3	2	3	1	3	-	-	-	-	-	1	-	-	2	2
CO4	2	2	3	-	3	2	-	-	-	-	-	-	2	3	2
Average	2.3	2.3	2.75	1.5	3	2	-	-	-	-	1.5		2	2.75	1.66
Level of Correlation	2	2	3	2	3	2	-	-	-	-	2		2	3	2

20ACC32SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

IV B.Tech I Semester-CSE(CS)

L	T	P	C
3	0	0	3

20ACC32: CYBER LAWS AND SECURITY POICIES

(Professional Elective -V)

COURSE OUTCOMES:

After completion of the course student will be able to

1. Understand the basic concepts of Section 80 of IT Act 2000, Cyber Crime, Computer Crime, Internet Theft/Fraud, Goods and Services.
2. Demonstrate the basic concepts of Cognizable and Non-Cognizable Offences, Hacking, Teenage Web Vandals, Prevalence and Victimology, Consumer Protection Act
3. Analyze the concepts of Arrest for "About to Commit" an Offence Under the IT Act, A tribute to Draco, Cyber Fraud, Computer as Commodities, Consumer Complaint.
4. Explain the concepts of Arrest, But No Punishment, Cyber Cheating, Theft of Intellectual Property, Restrictive and Unfair Trade practices

UNIT – I INTRODUCTION TO CYBER LAW EVOLUTION OF COMPUTER TECHNOLOGY 9 Hrs

Emergence of Cyber space. Cyber Jurisprudence, Jurisprudence and law, Doctrinal approach, Consensual approach, Real Approach, Cyber Ethics, Cyber Jurisdiction, Hierarchy of courts, Civil and criminal jurisdictions, Cyberspace-Web space, Web hosting and web Development agreement.

UNIT II INFORMATION TECHNOLOGY ACT: 9 Hrs

Overview of IT Act, 2000, Amendments and Limitations of IT Act, Digital Signatures, Cryptographic Algorithm, Public Cryptography, Private Cryptography, Electronic Governance, Legal Recognition of Electronic Records, Legal Recognition of Digital Signature Certifying Authorities, Cyber Crime and Offences, Network Service Providers Liability, Cyber Regulations Appellate Tribunal, Penalties and Adjudication.

UNIT III CYBER LAW AND RELATED LEGISLATION 9 Hrs

Patent Law, Trademark Law, Copyright, Software – Copyright or Patented, Domain Names and Copyright disputes, Electronic Data Base and its Protection, IT Act and Civil Procedure Code, IT Act and Criminal Procedural Code, Relevant Sections of Indian Evidence Act, Relevant Sections of Bankers Book Evidence Act, Relevant Sections of Indian Penal Code, Relevant Sections of Reserve Bank of India Act, Law Relating To Employees And Internet, Alternative Dispute Resolution , Online Dispute Resolution (ODR).

UNIT IV: ELECTRONIC BUSINESS AND LEGAL ISSUES **9 Hrs**

Evolution and development in Ecommerce, paper vs paper less contracts E-Commerce models- B2B, B2C,E security. Application area: Business, taxation, electronic payments, supply chain, EDI, E-markets, Emerging Trends.

UNIT V : CYBERSTALKKING **9 hRS**

Harassment Via E-Mails, Email Spoofing (Online A Method Of Sending E-Mail Using A False Name Or E-Mail Address To Make It Appear That The E-Mail Comes From Somebody Other Than The True Sender, Cyber Pornography (Exm.MMS),Cyber-Stalking.

TEXT BOOKS:

1 .K.Kumar," Cyber Laws: Intellectual property & E Commerce, Security",1 st Edition, Dominant Publisher,2011.

2. Rodney D. Ryder, " Guide To Cyber Laws", Second Edition, Wadhwa And Company, New Delhi, 2007.

3. Information Security policy &implementation Issues, NIIT, PHI.

REFERENCES:

1. Vakul Sharma, "Handbook Of Cyber Laws" Macmillan India Ltd, 2 nd Edition,PHI,2003.

2. Justice Yatindra Singh, " Cyber Laws", Universal Law Publishing, 1 st Edition,New Delhi, 2003.

3. Sharma, S.R., "Dimensions Of Cyber Crime", Annual Publication Pvt. Ltd., 1st Edition, 2004.

4. Augastine, Paul T.," Cyber Crimes And Legal Issues", Crecent Publishing Corporation, 2007.

Mapping:

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	*PO2*	*PO3*	*PO4*	*PO5*	*PO6*	*PO7*	*PO8*	*PO9*	*PO10*	*PO11*	*PO12*	*PSO1*	*PSO2*	*PSO3*
CO1	2	1	1	2	2	3	-	-	-	-	-	-	3	-	3
CO2	2	1	2	2	2	1	-	-	-	-	-	-	-	3	2
CO3	2	3	2	-	2	3	-	-	-	-	-	-	3	2	3
CO4	-	2	2	2	2	3	-	-	-	-	-	-	-	2	2
Average	2	1.75	1.75	2	2	2.5	-	-	-	-	-	-	3	2.33	2.5
Level of correlation	2	2	2	2	2	3	-	-	-	-	-	-	3	2	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

III B.Tech II Semester (Common to CSE, IT),
IV B Tech I Sem Professional Elective-V CSE(DS),CSE(AI& ML)
IV B Tech I Sem ME,ECE(Open Elective-IV)

L	T	P	C
3	-	-	3

20ACS28 **INTERNET OF THINGS**

COURSE OUTCOMES:

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

1. Understand the fundamentals of IoT, its applications.
2. Understand and analyze various tools for design of IoT system.
3. Analyze the Raspberry Pi tool and its features.
4. Deploy an IoT application and connect to the cloud.

UNIT-I 10 Hrs

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 13 Hrs

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, IOTsystems management with NETCONF,YANG – NETOPEER.

UNIT-III 9 Hrs

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, PythonPackages of Interest for IoT.

UNIT-IV 9 Hrs

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 withPython – Other IoT Devices.

UNIT-V 8 Hrs

Iot Physical Servers & Cloud Offerings: Introduction to Cloud Storage Models & Communication APIs, WAMP, AutoBahn 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, StamatisKarnouskos, "From Machine-to-Machine to the Internet of Things", Academic Press, 2014

Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3											3	3	3
CO2	3	3	3		1								3	2	3
CO3	3	3	3		2								3	2	3
CO4	3	3	3										3	2	3
Average	3	3	3		1.5								3	2.25	3
Level of Correlation	3	3	3		2								3	2	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

IV B.Tech I Semester –CSE(CS)

L	T	P	C
3	0	0	3

20ACM08:DEEP LEARNING
(Professional Elective -V)

COURSE OUTCOMES:

After completion of this course, the students will be able to:
1. Analyze a neural network by applying the basics of mathematics and machine learning.
2. Analyze the data using multilayer perceptron and backpropagation algorithms.
3. Apply regularization and optimization techniques to improve the performance of deep neural networks.
4. Identify appropriate deep learning model for text, multimedia, and biological data analysis.
5. Compare deep neural networks and deep learning models to infer the suitable learning algorithm on large scale data.

UNIT I: INTRODUCTION 09 Hrs

Historical Trends in Deep Learning – Machine Learning basics - Learning algorithms: Supervised and Unsupervised Training - Linear Algebra for Machine Learning - Testing - Cross Validation - Dimensionality Reduction - Over fitting /Under Fitting - Hyper parameters and validation sets - Estimators – Bias – Variance - Loss Function- Regularization

UNIT II: NEURAL NETWORKS 09 Hrs

Biological Neuron – Idea of Computational units - Linear Perceptron - Perceptron Learning Algorithm - Convergence theorem for Perceptron Learning Algorithm - Linear Separability - Multilayer perceptron – Backpropagation.

UNIT III: MODERN PRACTICES IN DEEP NETWORKS 10 Hrs

Introductions to Simple DNN - Platform for Deep Learning - Deep Learning Software Libraries - Deep Feed forward networks – Gradient-Based Learning - Architecture Design –Various Activation Functions, ReLU, Sigmoid – Error Functions - Regularization methods for Deep Learning - Early Stopping - Drop Out - Optimization methods for Neural Networks-Adagrad, Adam

UNIT IV: DEEP LEARNING MODELS 09 Hrs

Convolutional Neural Networks (CNNs): CNN Fundamentals – Architectures – Pooling – Visualization – Sequence Modeling: Recurrent Neural Networks (RNN) - Long-Short Term Memory (LSTM) – Bidirectional LSTMs-Bidirectional RNNs -Deep Unsupervised Learning: Autoencoders – Auto Encoder Applications - Deep Boltzmann Machine (DBM)

UNIT V: CASE STUDY AND APPLICATIONS **08 Hrs**

Application Case Study - Handwritten digits recognition using deep learning - LSTM with Keras – Sentiment Analysis – Image Dimensionality Reduction using Encoders LSTM with Keras – Alexnet - VGGnet

TEXT BOOKS:

1. Ian Goodfellow, YoshuaBengio, Aaron Courville, *Deep Learning*, 4th Edition, MIT Press,2016.

REFERENCE BOOKS:

1. KevinP.Murphy, "*MachineLearning: AProbabilisticPerspective*", MITPress,2012.
2. chael Nielsen, *Neural Networks and Deep Learning, Determination* Press, 2015.
3. Deng & Yu, *Deep Learning: Methods and Applications*, Now Publishers, 2013.

Additional Resources

1. https://www.youtube.com/watch?reload=9&v=aPfkYu_qiF4
2. http://www.deeplearning.net/tutorial/
3. https://www.guru99.com/deep-learning-tutorial.html
4. https://www.coursera.org/courses?query=deep%20learning

CO-PO and PSO Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	1	-	-	-	-	-	-	-	-	3	-
CO2	2	3	2	2	2	-	-	-	-	-	-	-	-	3	-
CO3	2	2	2	2	1	-	-	-	-	-	-	-	-	3	-
CO4	2	3	2	2	1	-	-	-	-	-	-	-	-	3	-
CO5	1	2	3	2	2	-	-	-	-	-	-	-	-	2	-
CO6	2	2	3	2	3	1	1	-	-	-	-	-	-	3	-
Average	2	2.5	2.2	2	1.3	1	1	-	-	-	-	-	-	2.8	-
Level of correlation of the course	2	3	2	2	1	1	1	-	-	-	-	-	-	3	-

Correlation Level: 3 - High 2 - Medium 1 – Low

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

IV B. Tech I Semester ECE (Professional Elective-V)

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

L	T	P	C
3	-	-	3

20AEC56:EMBEDDED SYSTEMS
(Open Elective -III)

Course Outcomes:

After completion of the course the student will be able to

1. Explain concept of embedded systems and its applications
2. Define various processors and explain their architecture
3. Design State machine and Concurrent Process Models
4. 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 singlepurpose 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 state machines, program state machine model (PSM), concurrent process model, concurrent processes, communication 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, IEEE 1394 Firewire, Ethernet, IEEE 802.11, Blue tooth.

UNIT V EMBEDDED / RTOS CONCEPTS:

REAL-TIMEOPERATING SYSTEMS – Operating System Overview, Operating System - Functions, Types and Services of Operating System, Architecture of the Kernel, Tasks and Task scheduler, Interrupt service routines, Semaphores, Mutex. Mailboxes, Message Queues, Event Registers, Pipes, Signals, Timers, Memory Management, Priority inversion problem.

TEXT BOOKS:

1.Frank Vahid, Tony D.Givargis,"Embedded System Design – A Unified Hardware/SoftwareIntroduction", John Wiley, 2002.

2.KVKK Prasad, "Embedded / Real Time Systems", Dream tech Press, 2005.

REFERENCE BOOKS:

1.David E. Simon, "An Embedded Software Primer", Pearson Ed., 2005.2.Raj Kamal, "Introduction to Embedded Systems", TMS, 2002.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2											
CO2	2		2											
CO3	3	2												
CO4	3	2												
Average	2.75	2	2											
Level of correlation	3	2	2											

3-High Mapping **2-Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

	L	T	P	C
	3	-	-	3

20AMB10 **INDUSTRIAL MARKETING**
(Open Elective -III)

Course Outcome:

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

1. Describe key concepts of industrial marketing.
2. Prepare proper segmentation and positioning for various industrial products.
3. Formulate robust marketing strategies for variety of situations in Indian and global context.
4. Apply and integrate Business-to-Business marketing theory with practice in a business context.
5. 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 motivesbusiness 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. Industrialproductlife cycle, product mix, Service component the provision of parts, technicalassistance, terms ofsales.

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, supportingand 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 PublishingHouse Pvt Limited.

REFERENCES:

1. Stacey, N., Wilson, A. (2014). Industrial Marketing Research (RLE Marketing): Managementand 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											3			
CO2											3			
CO3									2		3			
CO4									2		3			
CO5									2-		3			
Average									2		3			
Level of correlation									2		3			

3-High Mapping **2-Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech I Semester ME(PE-V)
IV B.Tech I Semester (Common to CE, CSE, CSE(DS),CSE(AI & ML),IT,CSE(CS))-(OE-III)
IV B.Tech I Semester EEE(OE-IV)

L	T	P	C
	-	-	3

20AME54:OptimizationTechniques

(Open Elective -III)

Course Outcomes:

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

1. Formulate unconstrained optimization techniques in the engineering application.
2. Formulate constrained optimization techniques for various application.
3. Implement neural network technique and swarm optimization to real world design problems.
4. Apply genetic algorithms and multi objective optimization to the complex engineering problems.
5. Evaluate solutions by various optimization approaches for structural and dynamic problem.

UNIT: I Unconstrained Optimization Techniques 10 Hrs

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 10 Hrs

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 10 Hrs

Introduction – Activation functions, types of activation functions, neural network architectures, Single layer feed forward network, multilayer feed forward network, Neural netwok applications. Swarm intelligence - Various animal behaviors, Ant Colony optimization, Particle Swarm optimization.

UNIT: IV Advanced Optimization Techniques 10 Hrs

Multistage optimization – dynamic programming; stochastic programming; Multi objective optimization, Genetic algorithms and Simulated Annealing technique.

UNIT: V Static and Dynamic Applications 10 Hrs

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.

TEXTBOOKS:

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.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**3**	**3**							**2**			
CO2	**3**	**3**	**3**	**3**							**2**			
CO3	**3**	**3**	**3**	**3**							**2**			
CO4	**3**	**3**	**3**	**3**							**2**			
CO5	**3**	**3**	**3**	**3**							**2**			
Average	**3**	**3**	**3**	**3**							**2**			
Level of correlation	**3**	**3**	**3**	**3**							**2**			

3-High Mapping **2- Medium Mapping** **1-Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester (Common To CSE, CSE (DS), CSE (AI&ML) & IT)

IV B.Tech I Semester ECE (Open Elective-III),CSE(CS)-JOE-III

L	T	P	C
3	-	-	3

COURSE OUTCOMES:

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

1. Implement fundamental cloud computing concepts.
2. Implement classical algorithms, including Ricart- Agrawala's algorithm and Maekawa's algorithm
3. Ensure transactions commit correctly in spite of replication.
4. Perform operations on Hadoop distributed file systems and develop virtualization applications

UNIT I **6Hrs**

Introduction to Clouds, MapReduce: Introduction to Cloud Computing Concepts, Orientation Towards Cloud Computing Concepts, Some Basic Computer Science Fundamentals, Introduction to Cloud Computing, History, New in Today's Clouds, Introduction to Clouds: New Aspects of Clouds, Introduction to Clouds: Economics of Clouds, Cloud distributed system, Distributedsystem, MapReduce Paradigm, MapReduce Examples, MapReduce Scheduling, MapReduce Fault-Tolerance.

UNIT II **10Hrs**

Gossip, Membership, and Grids: Introduction, Multicast Problem, The Gossip Protocol, Gossip Analysis, Gossip Implementations, Group Membership List, Failure Detectors, Gossip- Style Membership, Best failure detector, Another Probabilistic Failure Detector, Dissemination and suspicion, Grid Applications, Grid Infrastructure

P2P Systems: Introduction, Napster, Gnutella, FastTrack and Bit Torrent, Chord, Failures in Chord, Pastry, Kelips, Blue Waters Supercomputer.

Key-Value Stores, Time, and Ordering: Why Key-Value/NOSQL?, Cassandra, The Mystery of X-The Cap Theorem, The Consistency Spectrum, HBase, Introduction and Basics, Cristian's Algorithm, NTP, Lamport Timestamps, Vector Clocks.

UNIT III **8Hrs**

Classical Distributed Algorithms: Global Snapshot, Global Snapshot Algorithm, Consistent Cuts, Safety and Liveness, Multicast Ordering, Implementing Multicast Ordering,Implementing Multicast Ordering, Reliable Multicast, Virtual Synchrony, The Consensus Problem, Consensus In Synchronous Systems, Paxos, Simply, The FLP Proof, Orientation Towards Cloud Computing Concepts: Some Basic Computer Science Fundamentals, Introduction, The Election Problem, Ring Leader Election, Election in Chubby and ZooKeeper, Bully Algorithm, Introduction and Basics, Distributed Mutual Exclusion, Ricart-Agrawala's Algorithm, Maekawa's Algorithm andWrap-Up.

UNIT IV **8Hrs**

Concurrency and Replication Control: RPCs, Transactions, Serial Equivalence, Pessimistic Concurrence, Optimistic Concurrency Control, Replication, Two-Phase Commit.

Emerging Paradigms: Stream Processing in Storm, Distributed Graph Processing, Structure of Networks, Single-processor Scheduling, Hadoop Scheduling, Dominant-Resource Fair Scheduling, Storm Demo, Apache Spark by Faria Kalim.

UNIT V **7Hrs**

Classical Systems: Introduction, File System Abstraction, NFS and AFS, Distributed Shared Memory, Sensor and Their Networks.

Real-Life Behaviors: Introduction, Basic Security Concepts, Basic Cryptography Concepts, Implementing Mechanism using Cryptography, Causes of Disasters, AWS Outage, Facebook Outage, The Planet Outage, Wrap-Up.

TEXT BOOK:

1. https://www.coursera.org/learn/cloud-computing
2. https://www.coursera.org/learn/cloud-computing-2
3. Kobusińska, A., Leung, C., Hsu, C. H., Raghavendra, S., & Chang, V. (2018). Emerging trends, issues and challenges in Internet of Things, Big Data and cloud computing. Future Generation computer systems, 87, 416-419.
4. Dyer, J. (2018). Secure computation in the cloud using MapReduce. The University of Manchester (United Kingdom).

REFERENCE BOOK

1."Grid Computing a Research Monograph" by D. Janakiram, Tata McGraw hill publications

MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**	**3**	**2**	**2**									**3**	**1**	
CO2	**3**	**3**	**3**	**2**									**3**	**1**	
CO3	**3**	**3**						**1**					**3**	**2**	
CO4	**3**	**3**	**3**	**3**	**3**								**3**	**2**	
Average	**3**	**3**	**2.66**	**2.33**	**3**			**1**					**3**	**1.5**	
Level of Correlation	**3**	**3**	**3**	**3**	**3**			**1**					**3**	**2**	

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech I Semester –CSE(CS)

L	T	P	C
3	-	-	3

20ACC35:BLOCKCHAIN TECHNOLOGIES

(Job Oriented Elective –III)

COURSE OUTCOMES:

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

1. Understand the basics of Blockchain.
2. Learn Different protocols and consensus algorithms in Blockchain.
3. Learn the Blockchain implementation frameworks.
4. To understand the Blockchain Applications.
5. To experiment the Hyperledger Fabric, Ethereum networks.

UNIT I INTRODUCTION TO BLOCKCHAIN **7 Hrs**

Blockchain- Public Ledgers, Blockchain as Public Ledgers - Block in a Blockchain, Transactions-The Chain and the Longest Chain - Permissioned Model of Blockchain, Cryptographic –Hash Function, Properties of a hash function-Hash pointer and Merkle tree

UNIT II BITCOIN AND CRYPTOCURRENCY **6 Hrs**

A basic crypto currency, Creation of coins, Payments and double spending, FORTH – the

precursor for Bitcoin scripting, Bitcoin Scripts , Bitcoin P2P Network, Transaction in Bitcoin

Network, Block Mining, Block propagation and block relay

UNIT III BITCOIN CONSENSUS **6 Hrs**

Bitcoin Consensus, Proof of Work (PoW)- Hashcash PoW , Bitcoin PoW, Attacks on PoW

,monopoly problem- Proof of Stake- Proof of Burn - Proof of Elapsed Time - Bitcoin Miner, Mining Difficulty, Mining Pool-Permissioned model and use cases.

UNIT IV HYPERLEDGER FABRIC & ETHEREUM **5 Hrs**

Architecture of Hyperledger fabric v1.1- chain code- Ethereum: Ethereum network, EVM,

Transaction fee, Mist Browser, Ether, Gas, Solidity.

UNIT V BLOCKCHAIN APPLICATIONS **6 Hrs**

Smart contracts, Truffle Design and issue- DApps- NFT. Blockchain Applications in Supply Chain Management, Logistics, Smart Cities, Finance and Banking, Insurance,etc- Case Study.

TEXT BOOKS

1. Bashir and Imran, Mastering Blockchain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Blockchain frameworks, 2017.

2. 2.Andreas Antonopoulos, “Mastering Bitcoin: Unlocking Digital Cryptocurrencies”, O’Reilly, 2014.

REFERENCES:

1. Daniel Drescher, “Blockchain Basics”, First Edition, Apress, 2017.

2. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press, 2016.

3. Melanie Swan, “Blockchain: Blueprint for a New Economy”, O’Reilly, 2015

4. Ritesh Modi, “Solidity Programming Essentials: A Beginner’s Guide to Build Smart Contracts for Ethereum and Blockchain”, Packt Publishing

5. Handbook of Research on Blockchain Technology, published by Elsevier Inc. ISBN: 9780128198162, 2020

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	1	-	-	-	1	-	-	2	2	2	1
CO2	3	3	3	3	1	-	-	-	2	-	-	2	2	2	1
CO3	3	3	3	3	2	-	-	-	3	-	-	2	2	2	1
CO4	3	2	3	2	3	-	-	-	3	-	-	2	2	2	1
CO5	3	3	1	1	3	-	-	-	2	-	-	3	2	2	1
Average	3	2.8	2.4	2.2	2				2.2			2.2	2	2	1
Level of Correlation	3	3	2	2	2				2			2	2	2	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

IV B. Tech I Semester ECE (Professional Elective-IV)

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

L	T	P	C
3	-	-	3

20AEC51:DIGITAL IMAGE PROCESSING
(Open Elective -IV)

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 andQuantization - Basic relationships between pixels, and imaging geometry.

UNIT-II IMAGE TRANSFORMS:

Discrete Fourier Transform – Properties of 2 – D Fourier Transform – Fast Fourier Transform,Walsh, Hadamard, Discrete cosine transforms.

UNIT-III IMAGE ENHANCEMENT:

Image Enhancement in Spatial Domain, Enhancement Through Point Operation, Types of Point Operation, Histogram Manipulation, gray level Transformation, local or neighborhood operation, median filter, spatial domain high-pass filtering, Enhancement in frequency Domain, Image smoothing, Image sharpening, Color imagesImage 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, ErrorFree Compression, Lossy Compression, Lossy and Lossless Predictive Coding, Transform Based Compression, JPEG 2000 Standards.

UNIT-V IMAGE SEGMENTATION:

Detection of discontinuities. Edge linking and boundary detection, Thresholding, Regionoriented segmentation

TEXT BOOKS:

1.R. C .Gonzalez & R.E. Woods, “Digital Image Processing”, Addison Wesley/Pearson education, 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 McGraw Hill, 2010.

2.S Jayaraman, S Esakkirajan, T Veerakumar, “Digital Image processing”,Tata McGraw Hill. 2010.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	**3**	**2**	**1**												
CO 2	**2**	**1**	**2**	**2**											
CO 3	**3**	**1**													
Average	**2.66**	**1.33**	**1.5**	**2**											
Level of Correlation	**3**	**1**	**1**	**2**											

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester
(Common to CSE, IT, CSE(AI&ML) & CSE(DS),CSE(CS))

L	T	P	C
3	-	-	3

20AMB11:SOCIAL MEDIA MARKETING
(Open Elective -IV)

COURSE OUTCOMES:

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

1. Explain the required terminology and components of Social Media tactical and strategic plans.
2. Identify the place social media marketing has within the context of an organizations/business unit's/product's overall marketing strategy.
3. Evaluate an organizations effective engagement in social media to meet marketing objectives.
4. Measure the effectiveness of social media for marketing purposes and draft a social media strategy for a specific product.
5. 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:UNIT-II: CONTENT MARKETING–I: Developing a Content Marketing Strategy, Content Strategies- Building audience; Facebook: Creating groups and pages - Posts – Events - Ad campaigns – Objective, Managing Audience, Budget, scheduling and Ad Delivery; Twitter: Microblogging; Creating campaignson 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 wordsand 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	PSO3
CO1					**1**						**2**				
CO2					**1**						**2**				
CO3					**3**						**2**				
CO4					**3**						**2**				
CO5					**3**						**2**				
Average					**2.2**						**2**				
Level of correlation of the course					**2**						**2**				

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech I Semester (Common to ME(PE-I), ECE(OE-I)

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

L	T	P	C
3	-	-	3

20AME20:Total Quality Management & ReliabilityEngineering
(Open Elective -IV)

Course Outcomes:

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

1. Develop action plans for customer centric business on the basis of various quality philosophies.
2. Select the best solution for problem solving using QC tools, QFD model, JIT method.
3. Solve industry problems with available sources, software tools, modern TQM techniques with system approach.
4. Establish quality management system and environmental management system for product and service industries.
5. Design systems with a focus on enhancing reliability and availability.

UNIT: I INTRODUCTION 10 Hrs

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 10 Hrs

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, Terotechnology.

UNIT: III TQM TOOLS AND TECHNIQUE 10 Hrs

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 8 Hrs

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 10 Hrs

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.

Mapping of COs with POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3					3	3				1			
CO2	3	3				3	3				1			
CO3	3	3				3	3				1			
CO4	3					3	3				1			
CO5	3					3	3				1			
Average	3	1.2				3	3				1			
Level of correlation	3	1				3	3				1			

3- High Mapping 2- Medium Mapping 1-Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech I Semester

L	T	P	C
3	-	-	3

20ACC36 SECURITY PROFESSIONAL

(Job Oriented Elective –IV)

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)				
IV B.Tech I Semester –CSE(CS)				
	L	**T**	**P**	**C**
	3	**-**	**-**	**3**
20ACC37: MACHINE LEARNING FOR CYBER SECURITY **(Job Oriented Elective –IV)**				

Course Outcomes:

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

1. To introduce the basic concepts and techniques of machine learning and the need for Machine learning techniques for real world problem
2. To provide understanding of various Machine learning algorithms and the way to evaluate the performance of ML algorithms
3. To understand, learn and design simple artificial neural networks for the selected problem
4. To gain skills of how to combine multiple machine learning algorithms to solve the selected problem
5. To understand deep belief networks and applications

UNIT – I:

INTRODUCTION

Machine-Learning Paradigms: Introduction. Machine Learning Systems, Forms of Learning: Supervised and Unsupervised Learning, reinforcement – theory of learning – feasibility of learning – Data Preparation– training versus testing and split. Supervised Learning, Regression: Linear Regression, multi linear regression, Polynomial Regression, logistic regression, Non-linear Regression, Model evaluation methods.

UNIT – II:

Classification: – support vector machines – soft margin SVM – going beyond linearity – generalization and over fitting – regularization – validation-Naïve Bayesclassification,Ensemble Learning: BOOSTING - AdaBoost – Stumping- Gradient Boosting Machines and XGBoost –BAGGING -Subagging -Different Ways to Combine Classifiers-Random forest Classifier

UNIT – III:

Unsupervised learning

Nearest neighbor models – K-means – clustering around medoids – silhouettes – hierarchical clustering – k-d trees – locality sensitive hashing – non-parametric regression.

Clustering trees – learning ordered rule lists – learning unordered rule lists – descriptive rule learning – association rule mining – first-order rule learning

UNIT - IV:

Dimensionality Reduction - Linear Discriminant Analysis – Principal Component Analysis – Covariance's - limitations of PCA-Computing PCA Reinforcement learning- Example: Getting Lost -State and Action Spaces - Carrots and Sticks: The Reward Function -Discounting -Action Selection - Policy –MARKOV DECISION PROCESSES - The Markov Property - Probabilities in Markov Decision Processes

UNIT – V:

Neural Networks - The Perceptron -The Perceptron Learning Algorithm - LINEAR SEPARABILITY: The Perceptron Convergence Theorem - The Exclusive or (XOR) Function.**BACK-PROPAGATION OF ERROR** : The Multi-layer Perceptron Algorithm -Different Output Activation Functions -Sequential and Batch Training - Local Minima -Picking Up Momentum- Minibatches and Stochastic Gradient Descent- A Regression Problem - Classification with the MLP.

TEXT BOOKS:

1. MACHINE LEARNING An Algorithmic Perspective 2nd Edition,Stephen Marsland,2015, by Taylor & Francis Group, LLC

2. Introduction to Machine Learning ,The Wikipedia Guide

REFERENCE BOOKS:

1. Introduction to Machine Learning, Second Edition, Ethem Alpaydın, the MIT Press, Cambridge, Massachusetts, London, England.

2. Machine Learning , Tom M. Mitchell, McGraw-Hill Science, ISBN: 0070428077

3. Understanding Machine Learning:From Theory to Algorithms, c 2014 by ShaiShalev- Shwartz and Shai Ben-David, Published 2014 by Cambridge University Press.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester ,CSE

L	T	P	C
1	-	2	2

20ACS50 **SOURCE CODE MANAGEMENT USING GIT AND GITHUB (Skill Course)**

Course Outcome:

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

1. Understand fundamental tools for coding and collaboration
2. Install and run Git on your local machine
3. Use and interact with GitHub
4. Collaborate with others through remote repositories

LIST OF EXPERIMENTS

1. Basic Installation of GIT and GITHUB
2. Basic Commands on GIT (GIT cheat sheet)
3. Basic Commands on GITHUB (GITHUB Cheat sheet)
4. Create a "repository" (project) with a git hosting tool (like Bitbucket)
5. Copy (or clone) the repository to your local machine
6. Add a file to your local repo and "commit" (save) the changes
7. "Push" your changes to your main branch
8. Make a change to your file with a git hosting tool and commit
9. "Pull" the changes to your local machine
10. Create a "branch" (version), make a change, commit the change
11. Open a "pull request" (propose changes to the main branch)
12. "Merge" your branch to the main branch

Textbook

1. Scott Chacon and Ben Straub, Pro Git book, second Edition.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO
CO1	**2**				**1**								**1**	**2**
CO2	**2**				**2**								**2**	**2**
CO3	**2**				**1**								**3**	**2**
CO4	**2**			**1**	**2**								**1**	**3**
Average	**2**			**1**	**1.5**								**1.75**	**2.25**
Level of correlation	**2**			**1**	**2**								**2**	**2**

3 – High Mapping **2 – Medium Mapping** **3 – Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY(AUTONOMOUS)

IV B.Tech I Semester ,CSE

Common to CE, EEE, ME, ECE, CSE, IT, CSE(AI&ML) & CSE(DS),CSE(CS))

	L	T	P	C
	2	-	-	-

20AMB12 PROFESSIONAL ETHICS

COURSE OUTCOME

After completion of this course students will be able to:

1. Identify and analyze an ethical issue in the relevant field.
2. Apply specific ethical theories to current social issues.
3. Identify significant problems in contemporary professional ethics.
4. Explain the ethical roles of engineers in industry and society.
5. 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							2	3						
CO2							2	3						
CO3							2	3						
CO4							2	3						
CO5							2	3						
Average							2	3						
Level of correlation							2	3						

3 – High Mapping 2 – Medium Mapping 3 – Low Mapping