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 2020-21)

BACHELOR OF TECHNOLOGY
FOR

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

(For the Batches Admitted From 2020-2021)

&

B. Tech (Lateral Entry Scheme)

(For the Batches Admitted From 2021-2022)

COMPUTER SCIENCE AND ENGINEERING

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.
R.V.S. NAGAR, TIRUPATI ROAD, CHITTOOR – 517 127 (A.P) – INDIA

Website: www.svcetedu.org **E-mail:** hodcse@svcetedu.org

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. It is a mark of its abilityto 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 awards degrees 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 monitoringthe quality in education and has gladly accepted theresponsibilityof sustaining, the standards and ethics it has been striving for more than a decade in reaching its present standing in the arenaof contemporary technical education.

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

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

engineering graduates to the society.

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

Principal

Vision, 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 qualitypolicies and processes with continued improvements toenhance student's skills and talent for their exemplary contribution to thesociety, the nation and the world.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
R.V.S. NAGAR, CHITTOOR-517 127, ANDHRA PRADESH
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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 thereby 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):

1. Pursuing their careers in the IT or ITES industry or progressing to highereducation in Engineering or management.
2. Venture into entrepreneurship with a startup or an organization.
3. Continue to develop their professional knowledge and skills to be agileand relevant in the industry.

Program Specific Outcomes (PSOs) under R20 Regulations

Program Specific Outcomes (PSOs):

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

1. Analyse and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.
2. Use theoretical and practical concepts in interdisciplinary domains to provide solution to new ideas and innovations.

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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 2020-21)

and

B.Tech. (Lateral Entry Scheme)

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

1. Applicability : All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic 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 are to be obtained.

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

4. Programs of study offered leading to the award of B.Tech degree:

1. B.Tech (Civil Engineering)
2. B.Tech (Electrical and Electronics Engineering)
3. B.Tech (Mechanical Engineering)
4. B.Tech (Electronics and Communication Engineering)
5. B.Tech (Computer Science and Engineering)
6. B.Tech (Information Technology)
7. B.Tech (Computer Science and Engineering (Artificial Intelligence and Machine Learning))
8. B.Tech (Computer Science and Engineering (Data Science))

5. Choice Based Credit System:

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

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

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

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

The CBCS permits students to:

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

6. Medium of instruction:

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

7. Types of Courses:

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

7.1 Foundation / Skill Course:

Foundation courses are the courses based upon the content leads to enhancement of skill and knowledge. Skill subjects are those areas in which one needs to develop a set of 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

10. Curriculum and Course Structure:

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

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

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

10.1 Course Structure:

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

Table 2: Category-wise Distribution of Credits

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

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

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

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

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

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

10.6 A student shall be permitted to pursue up to a maximum of two open elective courses under MOOCs during the Programme as mentioned in course structure. Each of the courses must be of minimum 8 - 12 weeks in duration. Attendance will not be monitored for MOOC courses. Student has to pursue and acquire a certificate for a MOOC course only from the

Organizations/agencies approved by the BoS in order to earn the 3 credits. The Head of the department shall notify the list of such courses at the beginning of the semester.

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

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

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

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

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

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

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

11. Evaluation Methodology:

11.1 Theory Course:

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

11.2 Continuous Internal Assessment (CIA):

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

Two Sessional Examinations: 30 Marks

Five Assignments	: 10 Marks
	40 Marks

11.3 Question Paper Pattern for Sessional Examinations:

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

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

11.4 Semester End Examination (SEE):

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

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

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

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

11.5 Laboratory Course:

Each Laboratory Course will be evaluated for a total of 100 marks, consisting of 40 marks for internal assessment (CIA) and 60 marks for semester end lab examination. Out of 40marks of CIA, continuous lab assessment (SEE) for day to day performance will be done for 20 marks, final internal lab examination carries 15 marks and Viva-Voce carries 5 marks. The semester end lab examination for 60 marks shall be conducted by two examiners, one of 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 hours duration. The syllabus for the course is divided into FIVE units. The Question Paper consists of two parts, Part A and Part B. Part A consists of 5 short answer type questions, each carries 5 marks for a total of 25 marks with no choice.Part B Consists of 5 questions with one question from each of the 5 units with internal choice with 15 marks for each question.

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

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

11.9 Project Work:

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

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

11.10 Framework for Mandatory Internships:

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

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

11.10.3 In the final semester, the student should mandatorily undergo internship and parallelly he should work on a project with well-defined objectives. At the end of the semester the candidate shall submit an internship completion certificate and a project report. A student shall also be permitted to submit project report on the work 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 of internships is mandatory, if any student fails to complete internship, he will not be eligible for the award of degree. In such cases, the student shall repeat and completethe internship.

11.11 Framework for Skill Oriented Courses:

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

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

11.11.3 A pool of interdisciplinary job-oriented skill courses shall be designed by a Common Board of studies by the participating departments / disciplines and the syllabus along with the prerequisites shall be prepared for each of the laboratory infrastructure

Requirements. The list of such courses shall be included in the curriculum structure of each branch of Engineering, so as to enable the student to choose from the list.

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

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

11.11.6 If a student chooses to take a Certificate Course offered by industries / Professional bodies / APSSDC or any other accredited bodies, in lieu of the skill advanced course offered by the Department, the credits shall be awarded to the student upon 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 credits assigned to the course.

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

11.12 Gap Year:

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

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

The concept of Minor degree is introduced in the curriculum of all B. Tech. programs offering a Major degree. The main objective of Minor degree in a discipline is to provide additional learning opportunities for academically motivated students and it is an optional feature of the B.Tech Program. In order to earn a Minor degree in a discipline, a student has to

earn 20 extra credits, by studying FIVE courses each carrying four credits (in each course, three credits for theory and one credit for lab).

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

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

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

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

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

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

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

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

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

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

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

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

11.14 Framework for Honors Degree in a Discipline:

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

The main objective of Honors degree in a discipline is to provide additional learning opportunities for academically motivated students and it is an optional feature of the B. Tech. programme. In order to earn a Honors degree in his/her discipline, a student has to earn 20 extra credits by studying five advanced courses each carrying four credits for 20 credits in the concerned branch of Engineering. In place of advanced courses, he can study equivalent 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.

12. Attendance Requirements and Detention Policy:

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

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

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

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

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

13. Conduct of Semester End Examination and Evaluation:

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

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

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

13.4 Performance in all the subjects is tabulated program-wise and will be scrutinized by the office of the Controller of Examinations. Total marks obtained in each subject 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 he fulfills the academic requirements of securing **50** credits from:

a) Three Regular and Three Supplementary Examinations of I-Year I Semester.
b) Three Regular and Two Supplementary Examinations of I-Year II Semester
c) Two Regular and Two Supplementary Examination of II-Year I Semester.
d) Two Regular and One Supplementary Examinations II-Year II Semester.
e) One Regular and One Supplementary examination of III-Year I Semester.
f) One Regular Examination of III-Year II semester.

Irrespective of whether the candidate appears for the Semester-End examination or not as per the normal course of study and in case of getting detained for want of credits by sections 14.1 (ii) and 14.1 (iii) above, the student may make up the credits through supplementary examinations before the date of commencement of class work for III Year I Semester or IV Year I Semester as the case may be.

iv. A student shall register for all the **160** credits and earn all the **160** credits. Marks obtained in all the **160** credits shall be considered for the award of the class based on CGPA.

v. A student who fails to earn **160** credits as indicated in the course structure within eight academic years from the year of his admission shall forfeit his seat in B. Tech., Program and his admission stands cancelled.

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

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

14.2 For Lateral Entry Students:

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project if he secures not less than 35% of marks in the Semester-End examination and a minimum of 40% of marks in 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 number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

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

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

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

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

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 activities and applies the experience to personal and academic development.

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

Objective:

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

- To sensitize the students to the living conditions of the people who are around them,
- To help students to realize the stark realities of the society.
- To bring about an attitudinal change in the students and help them to develop societal consciousness, sensibility, responsibility and accountability.
- To make students aware of their inner strength and help them to find new /out of box solutions to the social problems.
- To make students socially responsible citizens who are sensitive to the needs of the disadvantaged sections.
- To help students to initiate developmental activities in the community in coordination with public and government authorities.

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

Implementation of Community Service Project:

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

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

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

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

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

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

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

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

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

Procedure:

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

• The Community Service Project is a twofold one –

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

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

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

EXPECTED OUTCOMES:

BENEFITS OF COMMUNITY SERVICE PROJECT TO STUDENTS:

Learning Outcomes:

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

BENEFITS OF COMMUNITY SERVICE PROJECT TO FACULTY MEMBERS:

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

BENEFITS OF COMMUNITY SERVICE PROJECT TO THE INSTITUTION:

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

BENEFITS OF COMMUNITY SERVICE PROJECT TO COMMUNITY:

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

RULES FOR DISCIPLINARY ACTION FOR MALPRACTICE / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices / Improper Conduct	Punishment
	If the candidate	
1.(a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination 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	Hours 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

Course Structure & Scheme of Examination

I B.Tech I Semester-CSE
Regulations: R20

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

I B.Tech II Semester-CSE
Regulations: R20

S.No	Category	Course code	Course title	Hours per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
1	HS	20AHS01	Communicative English	3	0	0	3	40	60	100
2	BS	20AHS03	Engineering Chemistry	3	0	0	3	40	60	100
3	BS	20AHS08	Algebra and Transformation Techniques	3	1	0	3	40	60	100
4	ES	20AEE05	Basic Electrical Engineering	3	1	0	3	40	60	100
5	ES	20ACS04	Problem Solving and Programming using Python	3	1	0	3	40	60	100
6	HS	20AHS05	Communicative English Lab	0	0	3	1.5	40	60	100
7	ES	20ACS05	Problem Solving and Programming using Python Lab	0	0	3	1.5	40	60	100
8	BS	20AHS06	Engineering Chemistry Lab	0	0	3	1.5	40	60	100
9	MC	20AMB01	Design Thinking	2	0	0	-	100	00	100
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	20ACS07	Object Oriented programming through JAVA	3	0	0	3	40	60	100
4	PC	20AIT01	Automata & Compiler Design	3	0	0	3	40	60	100
5	PC	20ACS08	Relational Database Management Systems	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	20ACS11	Android Application Development	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	20ACS12	Design and Analysis of Algorithms	3	0	0	3	40	60	100
4	PC	20ACS13	Operating Systems	3	0	0	3	40	60	100
5	PC	20AIT04	Software Engineering	3	0	0	3	40	60	100
6	ES/PC LAB	20ACS14	Design and Analysis of Algorithms 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	20AIT05	Software Engineering 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

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

Course Structure & Scheme of Examination

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	20ACS16	Web Technologies	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
		20ACS18	Cryptography and Network Security							
		20ACS19	Advanced Computer Architecture							
		20ACS20	Data Structure and Algorithms Using Java							
		20ACS21	Computer Graphics							
		20ACS22	C# and .NET Framework							
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							
		20ACS23	Social Network Analysis							
		20ACS24	Kivy - Interactive Applications and Games in Python							
6	PC LAB	20ACS25	Web Technologies 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	20ACS27/ 20ACS93		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	20ACS28	Internet Of Things	3	0	0	3	40	60	100
2	PC	20ACS29	Data Warehousing and Data Mining	3	0	0	3	40	60	100
3	PC	20ACS30	Advanced Styling with Responsive Design	3	0	0	3	40	60	100
4	PE	**Professional Elective Courses-II**		3	0	0	3	40	60	100
		20ACD08	Single Page Web Applications with AngularJS							
		20ACS31	Ethical Hacking							
		20ACS32	Distributed Operating Systems							
		20ACS33	Artificial Intelligence							
		20AIT12	Object Oriented Analysis and Design							
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							
		20ACM13	Business Intelligence							
		20ACS34	Machine Learning							
6	PCLAB	20ACS35	Data Warehousing and Data Mining lab	0	0	3	1.5	40	60	100
7	PC LAB	20ACS36	Advanced Styling with Responsive Design lab	0	0	3	1.5	40	60	100
8	PC LAB	20ACS37	Internet of Things Lab	0	0	3	1.5	40	60	100
9	SC	20ACD22	Shell programming	1	0	2	2	40	60	100
10	MC	20AHS23	Essence of Indian Traditional Knowledge	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
		20AIT20	Software Testing							
		20ACS38	Cryptocurrency and Blockchain Technologies							
		20ACS39	Cloud Computing							
		20ACD01	Foundations of Data science							
		20ACS40	Multimedia And Compression Techniques							
3	PE	**Professional Elective Courses-IV**		3	0	0	3	40	60	100
		20AIT24	Software Quality Assurance and Testing							
		20ACS41	Advanced Computer Networks							
		20ACS42	parallel Computing							
		20ACD12	Data Visualization Techniques							
		20ACS43	Big data Analytics							
4	PE	**Professional Elective Courses-V**		3	0	0	3	40	60	100
		20AIT26	Software Architecture							
		20ACS44	Wireless Network Technologies							
		20ACS45	Distributed Computing							
		20ACD07	Data Modelling techniques							
		20ACS46	Computer Vision							
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							
		20ACM26	Machine Learning Tools and Techniques							
		20ACS47	NoSQL Databases							
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							
		20ACS48	Virtual Reality							
		20ACS49	DevOps							
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	20ACS51		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	20ACS52	Project work, Seminar and Internship in Industry	0	0	24	12	40	60	100
	INTERNSHIP (6 MONTHS)									
TOTAL										**12**

1. **<u>HONORS DEGREE</u>:** Students has to acquire 20 credits with minimum one subject from each pool @ 4 credits per subject**.**

Semester	Course Code	Course Name	L	T	P	C	PRE-REQ	Offering Department
II-II	20ACS53	Real Time Systems	**3**	**1**	**0**	**4**	NIL	CSE
	20ACS54	Soft Computing and Neural Networks	**3**	**1**	**0**	**4**	NIL	CSE
	20ACS55	Advanced Databases	**3**	**1**	**0**	**4**	NIL	CSE
	20ACS56	Natural Language Processing	**3**	**1**	**0**	**4**	NIL	CSE
III-I (Any 1 Course from POOL-II)	20ACS57	Sentiment Analysis	**3**	**1**	**0**	**4**	DWDM	CSE
	20ACS58	Cyber Security Essentials	**3**	**1**	**0**	**4**	NIL	CSE
	20ACS59	Security of Cyber-Physical Systems	**3**	**1**	**0**	**4**	Statistics	CSE
	20ACS60	Internetworking with TCP/IP	**3**	**1**	**0**	**4**	Computer Networks	CSE
III-II (Any 1 Course from POOL-III)	20ACS61	Regression Modelling Strategies	**3**	**1**	**0**	**4**	Artificial Intelligence	CSE
	20ACS62	Secure Coding	**3**	**1**	**0**	**4**	Programming language	CSE
	20ACS63	Ubiquitous Sensing, Computing and Communication	**3**	**1**	**0**	**4**	NIL	CSE
	20ACS64	Storage Area Networks	**3**	**1**	**0**	**4**	Computer networks	CSE
III-II (Any 1 Course from POOL-IV)	20ACS65	Fuzzy Logic And Knowledge Based Systems	**3**	**1**	**0**	**4**	Artificial Intelligence	CSE
	20ACS66	Vulnerability Assessment & Penetration Testing	**3**	**1**	**0**	**4**	Testing	CSE
	20ACS67	Speech Processing	**3**	**1**	**0**	**4**	Image Processing	CSE
	20ACS68	Networking Essentials	**3**	**1**	**0**	**4**	Computer networks	CSE
IV-I (Any 1 Course from POOL-IV)	20ACS69	Neural Network	**3**	**1**	**0**	**4**	Machine Learning	CSE
	20ACS70	Malware Analysis	**3**	**1**	**0**	**4**	Security	CSE
	20ACS71	Advanced Computer Vision	**3**	**1**	**0**	**4**	Computer Vision	CSE
	20ACS72	High Performance Computing	**3**	**1**	**0**	**4**	Computer networks	CSE

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

BLOCK CHAIN

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

DATA SCIENCE

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

WEB DESIGNING

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

CYBER SECURITY

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

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech I Semester (Common to all Branches)	**L**	**T**	**P**	**C**
	3	**1**	**0**	**3**

20AHS02 DIFFERENTIAL EQUATIONS AND MULTIVARIABLE CALCULUS

Course Outcomes:

After 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 Hours**

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 Hours**

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 Hours**

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 Hours**

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 Hours**

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.

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
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 EEE, CSE, IT, CSE (DS) & CSE (AI &ML))
I B.Tech II Semester (Common to CE, ME, ECE, CAI, CSC & CSO)

L	T	P	C
3	0	0	3

20AHS04 ENGINEERING PHYSICS

Course Outcomes:

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

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

UNIT-I **9 Hours**

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 Hours**

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 Hours**

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

CRYSTAL PHYSICS: Single crystalline, Polycrystalline and amorphous materials -Fundamental of crystallography- Space lattice - Basis - unit cell - Lattice parameters - Crystal systems –Bravais Lattice - Structure and packing fraction of Simple cubic and body centered cubic - Miller Indices- Bragg's

law- X-ray diffraction by powder method.

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

UNIT-IV **9 Hours**

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 Hours20acd**

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**		7	8							
CO2		**3**	**2**												
CO3		**3**	**2**		**1**										
CO4		**2**			**2**	**1**									
Average		**2.75**	**2**		**1.33**	**1**									
Level of correlation		**3**	**2**		**1**	**1**									

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	-	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 Hall Publication.
3. Fundamentals of Data Structures in C, Ellis Horowitz, SartajSahni, Susan Anderson-Freed,Computer Science Press.
4. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. Ananda Rao,Pearson Education.
5. B.A. Forouzon and R.F. Gilberg, "COMPUTER SCIENCE: A Structured Programming Approach Using C", Third edition, CENGAGE Learning, 2016.
6. Richard F. Gilberg & Behrouz A. Forouzan, "Data Structures: A Pseudocode Approach withC", Second Edition, CENGAGE Learning, 2011.

Reference Books:

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

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**				7	8						**3**	**2**
CO2	**3**	**3**	3	1									**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 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, CSO,CAI,CSC)

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 to

1. Communicate 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 ideas effectively by using Orthographic Projections and Isometric Views using computer software.

UNIT:I **10 hours**

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 hours**

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

UNIT:III **10 hours**

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 hours**

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 hours**

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	3				
CO2	3	3	3		3				3					
CO3	3	3			3				3					
CO4	3	3			3				3	3				
Average	3	3	3		3				3	3				
Level of correlation	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 CSE, IT, CSE (DS) ,CSE (AI &ML),CSC,CSO,CAI)

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

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

UNIT- IV 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 Books:

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 Correlation	**3**	**3**	**1**	**3**									**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 EEE, CSE, IT, CSE (DS) & CSE (AI&ML)

I B.Tech II Semester (Common to CE, ME & ECE)

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 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. Ilustrate 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./fgl 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 the following searching operations for a key value in a given list of integers:

i) Linear search
ii) Binary search

Week 15

Write a C program that implements the following sorting methods to sort a given list of integers in ascending order

i) Bubble sort
ii) Selection sort

iii) Insertion sort

Week 16 (Case Study)

Create a -Railway reservation system| with the following modules

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

Text Books:

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

Reference Books:

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

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 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, CE, ME , ECE,CSO,CAI,CSC)

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-Jointand H-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	2		3				3					
CO2	3	2	2		3		7	8	3					
CO3	3	2	2		3				3					
CO4	3	2	2		3				3					
Average	3	2	2		3				3					
Level of correlation	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 EEE, CSE, CSE (DS), CSE (AI & ML) & IT)
I B.Tech II Semester (Common to CE, ME, ECE, CAI, CSC & CSO)

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 Hours**

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 Hours**

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 Hours**

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 Hours**

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 andconcerns, 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 Hours**

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 & TECHNOLOGY (AUTONOMOUS)

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

L	T	T	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 Hours**

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 Hours**

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 Hours**

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 Hours**

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 Hours**

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) Macmillan Education.

Mapping :

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

L	T	P	C
3	0	0	3

20AHS03 ENGINEERING CHEMISTRY

Course Outcomes:

After 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 Hours

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 Hours

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 Hours

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 Hours

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 Hours

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 & TECHNOLOGY
(AUTONOMOUS)
I B.Tech II Semester (Common to All Branches)

L	T	P	C
3	1	0	3

20AHS08 ALGEBRA AND TRANSFORMATION TECHNIQUES

Course Outcomes:

After 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 Hours**

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 Hours**

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 Hours**

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

UNIT-IV **10 Hours**

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 Hours**

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

Text Books:

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

Reference Books:

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

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. Analyze the concept of all types of Electrical DC Machines
4. Analyze the concept of all types of Electrical AC Machines

UNIT I:

D. C. Circuits: Ohm's Law and Kirchhoff's Laws - Analysis of series, parallel and series-parallel circuits excited by independent voltage sources - Power and energy.

Electromagnetism: Faradays Laws, Lenz's Law, Fleming's Rules, Statically and dynamically induced EMF - Concepts of self inductance, mutual inductance and coefficient of coupling - Energy stored in magnetic fields.

UNIT II: AC CIRCUITS

Generation of sinusoidal voltage - Definition of average value, root mean square value, form factor and peak factor of sinusoidal voltage and current and phasor representation of alternating quantities - Analysis with phasor diagrams of R, L, C, RL, RC and RLC circuits; Real power, reactive power, apparent power and power factor..

UNIT III: DC MACHINES

Working principle of DC machine as a generator and a motor - Types and constructional features- EMF equation of generator - Back EMF and its significance - torque equation - Types of D.C. motors - characteristics and applications - Necessity of a starter for DC motor

UNIT IV: AC MACHINES I

Transformers: Principle of operation and construction of single phase transformers - EMF equation – losses - efficiency and voltage regulation.

UNIT V: AC MACHINES II

Concept of rotating magnetic field - Principle of operation - types and constructional features - Slip and its significance - Applications of squirrel cage and slip ring motors – Stepper, Universal motor & Brushless DC Motor

Text books:

1. V.K.Mehta & Rohit Mehta, Principles of Electrical Engineering, S.Chand publications
2. D.P.Kothari and I.J. Nagarath –"Basic Electrical & Electronics Engineering", Mc.Grawhill publications

Reference Books:

1. H.Cotton, Electrical Technology, CBS Publishers & Distributors, 2004.
2. T.K.Naga sarkar, M.S.Sukhija, Basic Electrical Engineering, Oxford University press New Delhi, 2010

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	-	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 andvisualizations 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 ofArrays, 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, CharlesDierbach, 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 & TECHNOLOGY (AUTONOMOUS)

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

L	T	P	C
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
(Autonomous)

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

L	T	P	C
-	-	3	1.5

20ACS05 PROBLEM SOLVING AND PROGRAMMING USING PYTHON LAB

Course Outcomes:

After Completion of the course the student will be able to

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

WEEK 1

a. Write a python script to display a simple message

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

WEEK 2

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

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

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

WEEK 3

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

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

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

WEEK 4

a. Write a Python program

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

ii . To remove duplicates from a list.

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

iv. To get the difference between the two lists.

v. To append a list to the second list.

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

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

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

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

WEEK 5

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

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

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

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

WEEK 6

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

WEEK 7

a. Write a Python program

i. To create a set.

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

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

iv. To create a union and intersection of sets.

v. To create set difference.

WEEK 8

a. Write a python script to demonstrate string methods.

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

Sample String: google.com'

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

c. Write a Python program to reverse a string.

Sample String : "1234abcd"

Expected Output : "dcba4321"

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

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

Sample Input /Output

Input: Python – Output: onononon

Input: Exercises – Output: eseseses

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

WEEK 9

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

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

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

WEEK 10

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

WEEK 11

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

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

WEEK 12

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

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

WEEK 13

a. Write a python script to implement inheritance.

b. Write a python script to implement constructor.

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 & TECHNOLOGY
(AUTONOMOUS)

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

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

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 humanthinking 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 PhysicalProducts", 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 YourOrganization", 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)

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

L	T	P	C
3	-	-	3

20AHS10 NUMERICAL METHODS

Course Outcomes:

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 Hours**

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 Hours**

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 Hours**

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 Hours**

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 Hours**

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 age International Publishers.
3. N. Bail, M.Goyal & C.Walking, A Text Book of Advanced Engineering Mathematics-AComputerApproach.
4. Pal, Mathematical Methods, Oxford University Press, 2009.
5. S.S. Sastry, Introductory Methods of Numerical Analysis, Printice Hall of India publications, 2011

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												
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))

L	T	P	C
3	-	-	3

20ACS06 - COMPUTER ORGANIZATION AND ARCHITECTURE

Course Outcomes:

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

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

UNIT I **7 hrs**

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

UNIT II **8 hrs**

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

UNIT III **8 hrs**

MICRO PROGRAMMED CONTROL: Control memory, address sequencing, micro program example, 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-interrupt overhead- Buses: Synchronous and asynchronous- Arbitration.

UNIT V **8 hrs**

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

Text Books:

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

Reference Books:

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

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 (DS) & CSE (AI &ML))
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 and block statements. Arrays-one dimensional, two dimensional, String class, StringBuffer class, String Builder.

UNIT –II **8 hrs**

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

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

UNIT-III **6 hrs**

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

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

UNIT-IV **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, inter thread communication.

UNIT- V **9 hrs**

Enumerations, Wrapper classes, auto boxing, annotations.

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

Text Books:

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

Reference Books:

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

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 (AI &ML))
III B.Tech I Semester CSE (DS), Professional Elective-I

L	T	P	C
3	-	-	3

20AIT01 - AUTOMATA AND COMPILER DESIGN

Course Outcomes:

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

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

UNIT-I **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.

Text Books:

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

Reference Books:

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

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**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

L	T	P	C
3	-	-	3

20ACS08 - RELATIONAL DATABASE MANAGEMENT SYSTEMS

Course Outcomes:

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

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

UNIT –I **8 hrs**

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

UNIT-II **9 hrs**

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

UNIT-III **9 hrs**

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

UNIT-IV **9 hrs**

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

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

UNIT-V **8 hrs**

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

Text Books:

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

Reference Books:

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

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

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))

L	T	P	C
-	-	3	1.5

20ACS09 – OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

Course Outcomes:

At the end of the 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 HackerRank and HackerEarth

Example: HackerEarth –jumble letter, missing alphabets

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

Mapping:

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

L	T	P	C
-	-	3	1.5

20AIT02 - 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 of letters or Digits.
6. Design Predictive parser for the given language.
7. Design LALR bottom up parser for the given language.
8. Implementation of the symbol table.
9. Implementation of type checking.
10. Implementation of Dynamic Memory Allocation (Stack, Heap, Static)
11. Construction of a DAG (Directed Acyclic Graph)
12. Implementation of the Backend of the Compiler.

Text Books:

1. Introduction to Theory of computation, Sipser, 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

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	1.5

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 realistic problems.
4. Formulate queries using SQL tools for DML/DDL/DCL commands.

LIST OF EXPERIMENTS

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

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

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

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

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

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

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

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

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

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

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

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

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)

IV B.Tech I Semester (Common to CSE (DS) &CSE (AI & ML)

L	T	P	C
1	-	2	2

20ACS11 ANDROID APPLICATION DEVELOPMENT

Course Outcomes:

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

1. Create, test and debug Android application by setting up Android development Environment
2. Implement adaptive, responsive user interfaces that work across a wide range of Devices.
3. Demonstrate methods in preferences and settings and storing data in Android applications.
4. Demonstrate methods in sharing and loading data in Android Applications.

LIST OF EXPERIMENTS

1. Create a basic app to display the student details as Name, Roll No, Section and Phone No
2. Develop a simple android application to print some alert message using Android Alert Dialog.
3. Create an application that takes the name from a text box and shows hello message alongwith the name entered in text box, when the user clicks the OK button.
4. Create a screen that has input boxes for User Name, Password, Address, Gender(radio buttons for male and female), Age (numeric), Date of Birth (Date Picket), State (Spinner) and a Submit button. On clicking the submit button, print all the data below the Submit Button (use any layout).
5. Develop a simple android application to display food items with check box. Display selected food item using by pressing button "Order".
6. Design an android application Send SMS using Intent.
7. Develop an Android application using controls like Button, Text View, Edit Text for designing a calculator having basic functionality like Addition, Subtraction, Multiplication and Division.
8. Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 secs.
9. Create a user registration application that stores the user details in a database table.

10. Develop a simple application with one EditText so that user can write some text in it. Createa button called “Convert Text to Speech” that converts the user input text to voice.

Text Books:

1. Google Developer Training, "Android Developer Fundamentals Course – Concept Reference”, Google Developer Training Team, 2017. https://www.gitbook.com/book/google-developer-training/android-developerfundamentals-Course-concepts/details (Download pdf file from the above link).

Reference Books:

1. Erik Hellman, “Android Programming – Pushing the Limits”, 1st Edition, Wiley India. Pvt Ltd, 2014.
2. Dawn Griffiths and David Griffiths, “Head First Android Development”, 1st Edition, O’Reilly SPD Publishers, 2015.
3. J F DiMarzio, “Beginning Android Programming with Android Studio”, 4th Edition, Wiley India Pvt Ltd, 2016. ISBN-13: 978-8126565580
4. Anubhav Pradhan, Anil V Deshpande, “ Composing Mobile Apps” using Android, Wiley 2014, ISBN: 978-81-265-4660-2

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**	**3**	**1**	**3**								**3**	**3**
CO2	**3**	**1**	**3**		**3**								**3**	
CO3	**3**		**3**		**3**									**2**
CO4	**3**	**2**			**3**								**3**	**3**
Average	**3**	**1.66**	**3**	**1**	**3**								**3**	**2.66**
Level of Correlation	**3**	**2**	**3**	**1**	**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 CE, EEE, ME, ECE, CSE, IT, CSE(DS) ,CSE(AI &ML) ,CAI , CSC &CSO)

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

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

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

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

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

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

Understanding the harmony in the Nature; Interconnectedness and mutual fulfilment among the four orders of nature- recyclability and self-regulation in nature; Understanding Existence as Co-existence of mutually interacting units in all- pervasive space;Holistic perception of harmony 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- friendly production systems, c) Ability to identify and develop appropriate technologies and management patterns for above production systems.

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

a. At the level of individual: as socially and ecologically responsible engineers, technologists andmanagers
b. At the level of society: as mutually enriching institutions 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. ISBN 978-93-87034-53-2.

Reference Books:

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

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 Reasoningproblems.
2. Solve campus placements aptitude papers covering Quantitative Ability and VerbalAbility.
3. Apply different placement practice techniques.

UNIT- I **9 Hours**

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 Hours**

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 Hours**

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

UNIT-IV **9 Hours**

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

UNIT-V **9 Hours**

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) & 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 Hours

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 Hours

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 Hours

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

UNIT-IV 9 Hours

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

ANALYSIS OF VARIANCE – One way and Two way Classifications

UNIT-V **8 Hours**

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, 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 to solve 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 Hours

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 Hours

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- Sub Algebra, Direct product and homomorphism.

UNIT-III: 9 Hours

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

UNIT- IV: 9 Hours

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 Hours**

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 (Common to CSE, IT, CSE (DS))
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 Computer Algorithms, 2nd Edition, Universities Press, 2008.
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction to Algorithms,3rd Edition, MIT Press, 2009.
3. Introduction to the Design and Analysis of Algorithms, Anany Levitin:, 2rd Edition, 2009. Pearson.

Reference Books:

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

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 (Common to CSE, IT, CSE (DS) & CSE (AI &ML))

L	T	P	C
3	-	-	3

20ACS13 OPERATING SYSTEMS

Course Outcomes:

After Completion of the course the student will be able to

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

UNIT I

INTRODUCTION TO OS **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, CSE (DS) & CSE (AI &ML)

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, project scheduling, staffing, Organization and team structure, risk management, configuration management.

UNIT - II

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

UNIT -III

SOFTWARE DESIGN : Good Software Design, Cohesion and coupling, Control Hierarchy: Layering, Control Abstraction, Depth and width, Fan-out, Fan-in, Software design approaches, object oriented vs. function oriented design. Overview of SA/SD methodology, structured analysis,

Data flow diagram, Extending DFD technique to real life systems, Basic Object oriented concepts, UML Diagrams, Structured design, Detailed design, Design review, Characteristics of a good user interface, User Guidance and Online Help, Mode-based vs Mode-less Interface, Types of user interfaces, Component-based GUI development, User interface design methodology: GUI design methodology

UNIT - IV

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

UNIT-V

SOFTWARE QUALITY, RELIABILITY, AND OTHER ISSUES: Software reliability, Statistical testing, Software quality and management, ISO 9000, SEI capability maturity model (CMM), Personal software process (PSP), Six sigma, Software quality metrics, CASE and its scope, CASE environment, CASE support in software life cycle, Characteristics of software maintenance, Software reverse engineering, Software maintenance processes model, Estimation maintenance cost. Basic issues in any reuse program, Reuse approach, Reuse at organization level.

Text Books:

1. Rajib Mall, "Fundamentals of Software Engineering", 5th Edition, PHI, 2018.
2. Pressman R, "Software Engineering- Practioner Approach", McGraw Hill.

Reference Books:

1. Somerville, "Software Engineering", Pearson 2.
2. Richard Fairley, "Software Engineering Concepts", Tata McGraw Hill.
3. JalotePankaj, "An integrated approach to Software Engineering", Narosa

Online Learning Resources:

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

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

(Autonomous)

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

L	T	P	C
-	-	3	1.5

20ACS14 DESIGN & ANALYSIS OF ALGORITHMS LAB

Course Outcomes:

After Completion of the 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 using high level language tools.
3. Analyze and compare the performance of algorithms using language features.
4. Apply and implement learned algorithm design techniques and data structures to solve real-world problems.

LIST OF EXPERIMENTS

1. Sort a given set of elements using the Quicksort method and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versus n. The elements can be read from a file or can be generated using the random number generator.
2. Obtain the Topological ordering of vertices in a given digraph
3. Implement 0/1 Knapsack problem using Dynamic Programming
4. From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm
5. Find Minimum Cost Spanning Tree of a given undirected graph using Krushkal's algorithm.
6. Check whether a given graph is connected or not using DFS method.
7. Find Minimum Cost Spanning Tree of a given undirected graph using Prim"s algorithm.
8. Implement N Queen's problem using Backtracking.
9. Implement All-Pairs Shortest Paths problem using **Floyd's algorithm.**
10. Implement **Travelling Sales Person problem** using Dynamic programming

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

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, CSE (DS) & CSE (AI &ML))

L	T	P	C
-	-	3	1.5

20ACS15 OPERATING SYSTEMS LAB

Course Outcome:

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

1. Execute the basic command in UNIX operating system and shell program.
2. 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)CSCAN

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, CSE (DS) & CSE(AI &ML)	**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 of the system to be automated
4. Identify and analyze all the possible risks and its risk mitigation plan for the system to be automated
5. Diagnose any risk using Ishikawa Diagram (Can be called as Fish Bone Diagram or Cause& Effect Diagram)
6. Define Complete Project plan for the system to be automated using Microsoft Project Tool
7. Define the Features, Vision, Business objectives, Business rules and stakeholders in the vision document
8. Define the functional and non-functional requirements of the system to be automated by using Use cases and document in SRS document
9. Develop a tool which can be used for quantification of all the non-functional requirements
10. Write C/Java/Python program for classifying the various types of coupling.
11. Write a C/Java/Python program for classifying the various types of cohesion.
12. Write a C/Java/Python program for object oriented metrics for design proposed by Chidamber and Kremer. (Popularly called CK metrics)
13. Draw a complete class diagram and object diagrams using Rational tools

References:

1. Software Engineering? A Practitioner‟ s Approach, Roger S. Pressman, 1996, MGH.
2. Software Engineering by Ian Sommerville, Pearson Edu, 5th edition, 1999
3. An Integrated Approach to software engineering by Pankaj Jalote , 1991 Narosa

Online Learning Resources/Virtual Labs:

http://vlabs.iitkgp.ac.in/se/

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)

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

	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 Hours**

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 Hours**

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 Hours**

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 Hours**

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 Hours**

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

III B.Tech I Semester EEE, CSE, IT, CSE (AI&ML), & CSE (DS)

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, ARR, NPV, PI & IRR 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 BUSINESSORGANIZATIONS:

Market structures –Types of Competition –Features of perfect competition, Monopoly, Monopolistic competition –Price-Output Determination under perfect competition and Monopoly –Types of Business organization –Features, Merits and demerits of Sole proprietorship, Partnership and Joint stock companies –Types of companies –Public

enterprises –Types and Features –Changing business environment in post – Liberalization scenario

UNIT –IV 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 FINANCIAL ANALYSISTHROUGH 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), CapitalStructure Ratios (Debt-Equity Ratio and Interest Coverage Ratio) and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratio and EPS).

Text Books:

1. Aryasri A. R., Managerial Economics and Financial Analysis, 4/E, TMH, 2009.
2. 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 Ageinternational, 2009.

Reference Books:

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
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 AND TECHNOLOGY (AUTONOMOUS)

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

L	T	P	C
3	-	-	3

20ACS16 WEB TECHNOLOGIES

Course Outcomes:

At the end of the course the student 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.

REFERENCE BOOKS:

1. Robin Nixon, "Learning PHP, MySQL &JavaScript with jQuery, CSS and HTML5", 4thEdition, O'Reilly Publications, 2015. (ISBN:978-9352130153)
2. Luke Welling, Laura Thomson, "PHP and MySQL Web Development", 5th Edition, Pearson Education, 2016. (ISBN:978-9332582736)
3. Nicholas C Zakas, "Professional JavaScript for Web Developers", 3rd Edition, Wrox/Wiley India, 2012. (ISBN:978-8126535088)
4. David Sawyer Mcfarland, "JavaScript & jQuery: The Missing Manual", 1st Edition, O'Reilly/Shroff Publishers & Distributors Pvt Ltd, 2014 (ISBN: 978-9351108078)

5. Zak Ruvalcaba Anne Boehm, “Murach's HTML5 and CSS3”, 3rdEdition, Murachs/Shroff Publishers & Distributors Pvt Ltd, 2016. (ISBN:978-9352133246)

Mapping :

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

At the end of the course the student 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. Analyse 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, References 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.

REFERENCE BOOKS:

1. Data Communications and Networking, Fifth Edition, Behrouz A. Forouzan, Tata McGraw Hill,2012.
2. Computer Networking: A Top ,Down Approach Featuring the Internet, Six Edition, James F. Kurose, K.W. Ross, Pearson Education,2013
3. Computer Communications and Networking Technologies, Michael A. Gallo, William M. Hancock, Cengage Learning,2001.

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

(Common to CSE, IT, CSE (DS), CSE (AI & ML))

L	T	P	C
3	-	-	3

20ACS18 CRYPTOGRAPHY AND NETWORK SECURITY

(Professional Elective -I)

COURSE OUTCOMES:

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

1. Identify different types of Attacks and interpret various cryptography techniques.
2. Select the appropriate cryptography algorithm based on the requirements and Applications.
3. Apply Hash algorithm for generating Digital signatures.

UNIT – I **9 hrs**

Introduction and Mathematical Foundations: Introduction, Overview on Modern Cryptography, Number Theory, Probability and Information theory.

Classical Cryptosystems: Cryptanalysis of Classical Cryptosystems, Shannon's Theory.

UNIT – II **9 hrs**

Symmetric Key Ciphers: Modern Block Ciphers - DES, AES.

Cryptanalysis of Symmetric key Ciphers: Linear Cryptanalysis, Differential Cryptanalysis, Other Cryptanalytic Techniques, Overview on S-Box Design Principles, Modes of Operation of Block Ciphers.

UNIT – III **9 hrs**

Stream Ciphers and Pseudo randomness: Stream Ciphers and Pseudorandom Functions.

Hash Functions and MACs: The Merkle Damgard Construction and Message Authentication Codes.

UNIT – IV **9 hrs**

Asymmetric Key Ciphers: Construction and Cryptanalysis - More Number Theoretic Results, The RSA Cryptosystem, Primality Testing, Factoring Algorithms, Other attacks on RSA and Semantic Security of RSA, The Discrete Logarithm Problem (DLP) and the Diffie Hellman Key

Exchange Algorithm, The ElGamal Encryption Algorithm, Cryptanalysis of DLP.

UNIT V **9 hrs**

Digital Signatures: Signature schemes.

Modern Trends in Asymmetric Key Cryptography: Elliptic Curve Based Cryptography.

Network Security: Secret Sharing Schemes, A Tutorial on Network Protocols, Kerberos, Pretty Good Privacy (PGP), Secure Socket Layer (SSL), Intruders and Viruses, Firewalls.

TEXT BOOKS:

1. Douglas Stinson, "Cryptography Theory and Practice", 2nd Edition, Chapman & Hall/CRC.

2. B. A. Forouzan, "Cryptography & Network Security", Tata Mc Graw Hill.

3. W. Stallings, "Cryptography and Network Security", Pearson Education.

REFERENCE BOOKS:

1. Wenbo Mao, "Modern Cryptography, Theory & Practice", Pearson Education.
2. Hoffstein, Pipher, Silvermman, "An Introduction to Mathematical Cryptography", Springer.
3. J. Daemen, V. Rijmen, "The Design of Rijndael", Springer.
4. A. Joux,"Algorithmic Cryptanalysis", CRC Press.
5. S. G. Telang, "Number Theory", Tata Mc Graw Hill.
6. C. Boyd, A. Mathuria, "Protocols for Authentication and Key Establishment", Springer.
7. Matt Bishop, "Computer Security", Pearson Education.

WEB REFERENCES

1. https://nptel.ac.in/courses/106105031

MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	**3**	3											**3**	**2**
C02	**3**	**3**											**3**	**2**
C03	**3**	**3**	**3**	1									**3**	**2**
Average	**3**	**3**	**3**	1									**3**	**2**
Level of Correlation	**3**	**3**	**3**	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 (Common to CSE, IT)

L	T	P	C
3	-	-	3

20ACS19 ADVANCED COMPUTER ARCHITECTURE
(Professional Elective -I)

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

1. Explain the concepts of parallel computing and hardware technologies.
2. Compare and contrast the parallel architectures.
3. Explain the concepts of scalable architectures.
4. Illustrate parallel programming concepts.

UNIT-I 10 hrs

Theory of Parallelism: Parallel Computer Models, The State of Computing, Multiprocessors and Multicomputer ,Multifactor and SIMD Computers ,PRAM and VLSI Models, Program and Network Properties ,Conditions of Parallelism, Program Partitioning and Scheduling, Program Flow Mechanisms, System Interconnect Architectures, Principles of Scalable Performance, Performance Metrics and Measures, Parallel Processing Applications, Speedup Performance Laws, Scalability Analysis and Approaches.

UNIT-II 10 hrs

Hardware Technologies: Processors and Memory Hierarchy, Advanced Processor Technology, Superscalar and Vector Processors, Memory Hierarchy Technology, Virtual Memory Technology.

UNIT-III 10 hrs

Bus, Cache, and Shared Memory ,Bus Systems ,Cache Memory Organizations ,Shared Memory Organizations ,Sequential and Weak Consistency Models ,Pipelining and Superscalar Techniques ,Linear Pipeline Processors ,Nonlinear Pipeline Processors ,Instruction Pipeline Design ,Arithmetic Pipeline Design

UNIT-IV 10 hrs

Parallel and Scalable Architectures: Multiprocessors and Multi computers ,Multiprocessor System Interconnects, Cache Coherence and Synchronization Mechanisms, Three Generations of Multicomputer ,Message-Passing Mechanisms ,Multivector and SIMD Computers ,Vector Processing Principles ,Multivector Multiprocessors ,Compound Vector Processing ,SIMDComputer Organizations (Scalable, Multithreaded, and Dataflow Architectures, Latency-Hiding Techniques, Principles of Multithreading, Fine-Grain Multicomputer, Scalable and Multithreaded Architectures, Dataflow and Hybrid Architectures.

UNIT-V **10 hrs**

Software for parallel programming: Parallel Models, Languages, and Compilers ,Parallel Programming Models, Parallel Languages and Compilers ,Dependence Analysis of Data Arrays ,Parallel Program Development and Environments, Synchronization and Multiprocessing Modes. Instruction and System Level Parallelism, Instruction Level Parallelism ,Computer Architecture ,Contents, Basic Design Issues ,Problem Definition ,Model of a Typical Processor ,Compiler-detected Instruction Level Parallelism ,Operand Forwarding ,Reorder Buffer, Register Renaming ,Tomasulo's Algorithm ,Branch Prediction, Limitations in Exploiting Instruction Level Parallelism ,Thread Level Parallelism.

TEXT BOOK:

1. Kai Hwang and Naresh Jotwani, Advanced Computer Architecture (SIE): Parallelism, Scalability, Programmability, McGraw Hill Education 3/e. 2015

REFERENCE BOOK:

1. John L. Hennessy and David A. Patterson, Computer Architecture: A quantitative approach, 5th edition, Morgan Kaufmann Elseveir, 2013

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech I Semester CSE

L	T	P	C
3	-	-	3

20ACS20 DATA STRUCTURES AND ALGORITHMS USING JAVA

(Professional Elective -I)

Course Outcomes:

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

1. Apply the Fundamental concepts of Data Structures and Algorithms using java programming language.
2. Implement data structure concepts using Java Collection Framework and generic classes.
3. Explain Tree data structures, Graphs and Map Framework.
4. Explore the Searching and Sorting algorithms and file handling.

UNIT –I 6 hrs

Importance of Data Structures, Types, Generic Classes, Parameterized and Bounded Argument Generic Classes, Java Collection Framework, Map Framework Legacy Classes.

UNIT-II 7 hrs

Array Data Structures, Array list, Vector for Arrays, Linked list Data Structure, Programming for linked list, Linked list using JCF, Stack Data Structures, Programming for Stacks, Stacks using JCF, Queue Data Structures, Programming for queues, Queue using JCF.

UNIT –III 8 hrs

Tree Data Structures, Binary Tree, Binary Search Tree, Height Balanced BST, Heap Trees, Huffman Tree, Graphs structures and algorithms, Map Framework and its applications.

UNIT –IV 9 hrs

Set, Collection, operations on set collections, Java I/O streams, File I/O, Random Access File, Searching Algorithms – Linear, Non-Linear, Sorting Algorithms, and Sorting Using JCF.

UNIT –V 7 hrs

String Class and its applications, Class String Buffer, Utilities and Java Cursor Iterator

REFERENE BOOKS:

1. Classic Data Structures (2nd Edition) Debasis Samanta, Prentice Hall India

2. Java: The Complete Reference Hebert Schildt, Mc Graw Hill

3. Object-Oriented Programming with C++ and Java Debasis Samanta, Prentice Hall India

4. Swayam-NPTEL online course entitles Programming in Java Debasis Samanta

.

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	2								3	
CO3	3												3	2
CO4	3	3											3	1
Average	3	2.66	2	2	2								3	1.33
Level of Correlation	3	3	2	2	2								3	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)-PE-I
III B.Tech I Semester ME(Open Elective-I)
III B.Tech II Semester CE(Open Elective-II)

L	T	P	C
3	-	-	3

20ACS21 COMPUTER GRAPHICS
(Professional Elective -I)

COURSE OUTCOMES:

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

1. Demonstrate different computer graphics applications and standards.
2. Design algorithms to render different geometric shapes like line, circle, and ellipse and Appreciate illumination and color models.
3. Analyze the issues in projecting graphical objects and identify solutions
4. Compare different 2D, 3D viewing and clipping techniques.
5. Develop solutions to problems related to computer graphics and animations by creating, rendering and projecting the Graphical object.

UNIT-I **8 Hrs**

Introduction: Basic concepts, Application areas of Computer Graphics, overview of graphics systems , Video-display devices, Raster-scan systems, Random-scan systems , Graphics monitors and work stations and input devices, graphics standards.

UNIT-II **10 Hrs**

Output primitives: Points and lines, line drawing algorithms – DDA, Bresenham's, midpoint circle Generating Algorithm-Ellipse Generating Algorithms, Filled area primitives , Scan line polygon fill algorithm, inside-outside tests, boundary-fill and flood-fill algorithms.

UNIT-III **10 Hrs**

2D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations betweencoordinate systems.

2D viewing: The viewing pipeline, Window-to-Viewport coordinate transformation, viewing functions, Cohen-Sutherland line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT-IV **10 Hrs**

Three Dimensional Concepts: 3,D Display method, 3,D object representation: Polygon surfaces, Curved lines and surfaces, quadric surfaces, spline representation, Bezier curve and

B-spline curves, Beizer and B-spline surfaces, Hermite curve.

3D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations,composite transformations.

3D Viewing: Viewing pipeline, viewing coordinates, projections, clipping.

UNIT-V **8Hrs**

Color Model and its Applications: RGB Color Model, YIQ Color Model, CMY Color Model ,HSV Color Model .**Computer animation:** Design of animation sequence, General Computer animation Function, Raster animations, Key-Frame Systems, Morphing, motion specifications, Direct Motion specifications , Kinematics and Dynamics.

TEXT BOOKS:

1. Donald Hearn and M.Pauline Baker,"*Computer Graphics C version"*,2nd edition,
, PearsonEducation,1997.
2. Foley, VanDam, Feiner and Hughes ,"*Computer Graphics Principles & practice*", second editionin C, Pearson Education,1995.

REFERENCE BOOKS:

1. Steven Harrington,"*Computer Graphics*", TMH,1983
2. Zhigandxiang, Roy Plastock ,"*Computer Graphics Second edition*", Schaum's outlines, Tata Mc,Graw hill edition,2000.

Mapping:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2											3	1
CO2	3	3	3										3	
CO3	3	3	2	2									3	1
CO4	3	3	1	1									2	2
CO5	3	2	2	2	2								3	3
Average	3	2.6	2	1.67	2								2.8	1.75
Level of Correlation	3	3	2	2	2								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

L	T	P	C
3	-	-	3

20ACS22 **C# and .NET Framework**
(Professional Elective -I)

Course outcome

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

1. Write various applications using C# Language in the .NET Framework.
2. Develop distributed applications using .NET Framework.
3. Create mobile applications using .NET compact Framework.

UNIT-I **8 Hrs**

CORE C#: Fundamentals of C# , Nullable Types ,Using Predefined Types, Controlling Program Flow, Organization with Namespaces, Working with Strings, Comments, C# Preprocessor Directives, C# Programming Guidelines.

CLASSES, RECORDS, STRUCTS, AND TUPLES: Creating and Using Types, Pass by Value or by Reference, Classes, Methods, Constructors, Expression, Records, Structs, Enum Types, ref, in, and out, Value Tuple, Deconstruction, Pattern Matching, Property Pattern, Partial Types.

UNIT-II 10 Hrs

Object-Oriented Programming In C#: Object Orientation, Inheritance with Classes, Virtual, Modifiers, Access Modifiers, Inheritance with Records, Using Interface, Generics, Constraints.

Operators And Casts: Operators, Using Binary Operators, Type Safety, Operator Overloading, Comparing Objects for Equality, Implementing Custom Indexers, User-Defined, Conversions,

Arrays: Multiple Objects of the Same Type, Simple Arrays, Multidimensional Arrays, Jagged Arrays, Array Class, Arrays as Parameters, Enumerators, Using Span with Arrays, Indices and Ranges, Array Pools, BitArray.

UNIT-III 9 Hrs

Delegates, Lambdas, And Events: Referencing Methods, Delegates, Lambda Expressions, Events.

Collections: Overview, Collection Interfaces and Types, Lists, Stacks, Linked Lists, Sorted List, Dictionaries, Sets, Performance, Immutable Collections

Language Integrated Query: LINQ Overview, Standard Query Operators, Parallel LINQ, LINQ Providers.

Errors And Exceptions: Handling Errors, Predefined Exception Classes, Catching Exceptions,

Caller Information.

UNIT IV 10 Hrs

Tasks And Asynchronous Programming: Why Asynchronous Programming Is Important, Task-Based Async Pattern, Tasks, Error Handling, Cancellation of async Methods, Async Streams, Async with Windows Apps.

Reflection, Metadata, And Source Generators: Inspecting Code at Runtime and Dynamic Programming, Custom Attributes, Using Dynamic Language Extensions for Reflection, , ExpandoObject, Source Generators,

Managed And Unmanaged Memory: Memory, Memory Management Under the Hood, Strong and Weak References, Working with Unmanaged Resources, Unsafe Code, Span<T>, Platform Invoke.

UNIT V 8 Hrs

Libraries, Assemblies, Packages and NUGET, Logging, Metrics, Managing the File System, Iterating Files, Working with Streams, Compressing files, Using Sockets, Using TCP classes, Using UDP, Using Web Services, Namespace System Globalization, Resources, Localization withWinUI, Unit Test, Understanding Web Technologies, Creating an ASP.NET Core Web Project, REST Services with ASP.NET Core, Creating a .NET Client, Introducing Windows Apps, Introducing XAML, Working with Data Binding.

TEXT BOOK:

1. Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson, Morgan Skinner. ―Professional C# and .NET 4.5, Wiley.
2. Harsh Bhasin, ―Programming in C#, Oxford University Press.

REFERENCES:

1. Ian Gariffiths, Mathew Adams, Jesse Liberty, ―Programming C# 4.0‖, OReilly, Fourth Edition.
2. Andrew Troelsen, Pro C# 5.0 and the .NET 4.5 Framework, Apress publication.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**	**2**	**1**	**2**								**3**	**1**
CO2	**3**	**3**	**2**	**2**	**3**								**3**	**2**
CO3	**3**	**3**	**2**	**2**	**3**								**3**	**3**
Average	**3**	**2.66**	2	**1.66**	2.66								**3**	**2**
Level of Correlation	**3**	**3**	2	**2**	3								**3**	**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))

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 - OnlyMemory, Programmable Logic Array(PLA), Programmable Array Logic(PAL), Sequential Programmable Devices.

TEXT BOOKS:

1. Digital Design, 5/e, M.Morris Mano, Michael D Ciletti, PEA.
2. Fundamentals of Logic Design, 5/e, Roth, Cengage.

REFERENCE BOOKS:

1. Digital Logic and Computer Design, M.Morris Mano, PEA.
2. Digital Logic Design, Leach, Malvino, Saha, TMH.
3. Modern Digital Electronics, R.P. Jain, TMH.

mapping:

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech - I – Semester ECE (OE-III)
III B.Tech I Semester (Common to CSE, IT,CSD , CSM & EEE)
III B.Tech - I – Semester ME (PE-I)

L	T	P	C
3	0	0	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 hours**

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 **10 hours**

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 **12 hours**

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:4 Manipulator Kinematics and Trajectory Planning 10 hours

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:5 Robot Applications and Programming 8 hours

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.

Textbook(s)

1. M.P. Groover, Industrial Robotics, Second Edition, New Delhi, Tata McGraw Hill, 2017.
2 R.K. Mittal & I.J.Nagrath, Robotics and Control, New Delhi, 3rdEdition, Tata McGraw Hill, 2017.
3 John J.Craig, Introduction to Robotics Mechanics and Control, Third edition, Pearson Education, 2009.

Reference Books

1 Ashitava Ghoshal, Robotics-Fundamental Concepts and Analysis', Oxford University Press, Sixth impression, 2010.
K.S. Fu, Robotics, New Delhi, 3rd Edition, Tata McGraw Hill, 2008.

2 **Mapping:**

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

CIVIL ENGINEERING

L	T	P	C
3	0	0	3

III B.Tech –I Semester (CSE,IT,CSE(DS) & CSE (AI&ML)

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. AarneVeslind, "Solid Waste Engineering", 2nd Edition Cengage Learning,2012(ISBN-13:978-1-4390-6217-3)
2. George Tchobanoglous, Hilary Theisen and Samuel A Vigil, "Integrated Solid Waste Management",Tata Mc GrawHill, 1993.
3. The Central Public Health and Environmental Engineering Organization (CPHEEO),"Manualon Solid Waste Management", India, 2016.

REFERENCES

1. "MunicipalSolidWasteManagementRules2016",CentralPollutionControlBoard,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 EnvironmentandForest and Climate Change, Govt. ofIndia, 2016.

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester ,CSE
IV B.Tech I Semester IT(Honors degree)

L	T	P	C
3	-	-	3

20ACS23 **SOCIAL NETWORK ANALYSIS**
(Job Oriented Elective I)

Course Outcomes:

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

1. Understand the concept of semantic web and related applications.
2. Learn knowledge representation using ontology.
3. Understand human behaviour in social web and related communities.
4. Learn visualization of social networks.

UNIT I INTRODUCTION **9 hrs**

Introduction to Semantic Web: Limitations of current Web - Development of Semantic Web - Emergence of the Social Web - Social Network analysis: Development of Social Network Analysis -Key concepts and measures in network analysis - Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities - Web-based networks.

UNIT II MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION **9 hrs**

Ontology and their role in the Semantic Web: Ontology-based knowledge Representation - Ontology languages for the Semantic Web: Resource Description Framework - Web Ontology Language - Modelling and aggregating social network data: State-of-the-art in network data representation -Ontological representation of social individuals - Ontological representation of social relationships –Aggregating and reasoning with social network data - Advanced representations

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UNIT III EXTRACTION AND MINING COMMUNITIES IN SOCIAL NETWORKS **9hrs**

Extracting evolution of Web Community from a Series of Web Archive – Detecting communities in social networks - Definition of community – Evaluating communities - Methods for community detection and mining - Applications of community mining algorithms - Tools for detecting communities social network infrastructures and communities - Decentralized online social networks - Multi Relational characterization of dynamic social network communities.

UNIT IV PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES

9 hrs

Understanding and predicting human behaviour for social communities - User data management - Inference and Distribution - Enabling new human experiences - Reality mining - Context - Awareness - Privacy in online social networks - Trust in online environment - Trust models based on subjective logic - Trust network analysis - Trust transitivity analysis - Combining trust and reputation – Trust derivation based on trust comparisons - Attack spectrum and countermeasures.

UNIT VVISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS 9 hrs

Graph theory - Centrality - Clustering - Node-Edge Diagrams – Matrix representation - Visualizing online social networks, Visualizing social networks with matrix-based representations - Matrix and Node-Link Diagrams – Hybrid representations - Applications - Cover networks - Community welfare -Collaboration networks - Co-Citation networks.

TEXT BOOKS:

1. Peter Mika, "Social Networks and the Semantic Web", First Edition, Springer 2007. (UNIT I,II)
2. Borko Furht, "Handbook of Social Network Technologies and Applications", 1st Edition, Springer, 2010. (UNIT III,IV,V)

REFERENCES:

1. Guandong Xu ,Yanchun Zhang and Lin Li, "Web Mining and Social Networking – Techniques and applications", First Edition Springer, 2011.
2. Dion Goh and Schubert Foo, "Social information Retrieval Systems: Emerging Technologiesand Applications for Searching the Web Effectively", IGI Global Snippet, 2008.

3. Max Chevalier, Christine Julien and Chantal Soulé-Dupuy, “Collaborative and Social Information Retrieval and Access: Techniques for Improved user Modelling”, IGI Global Snippet, 2009.

4. John G. Breslin, Alexander Passant and Stefan Decker, “The Social Semantic Web”, Springer, 2009

Mapping:

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

L	T	P	C
3	-	-	3

20ACS24 **Kivy- INTERACTIVE APPLICATIONS AND GAMES IN PYTHON (Job Oriented Elective-I)**

Course Outcomes:

After completion of the course the student will be able to

1. Apply basic widget and binding actions to build an interface
2. Understanding basic shapes to create an effective graphics canvas
3. Apply the screen manager techniques to improve user experience on multitouching.
4. Apply the Invaders Revenge to build an interactive multitouch game.

UNIT-I GUI BASICS AND GRAPHICS 6 hrs

Basic widgets- labels and buttons, Layouts, Embedding Layouts, Comic creator. Basic shapes, Images, Colors and backgrounds, Rotating, translating and scaling; comic creator- PushMatrix and PopMatrix.Case study on "Building a clock App".

UNIT-II WIDGET EVENTS-BINDING ACTIONS 8 hrs

Attributes, id and root; Basic widget event- dragging the stickman; Localizing coordinates – adding stickmen; Binding and unbinding events- sizing limbs and heads; Binding events in the Kivy languge; Creating your own events- the magical properties; Kivy and properties. Case study on "Building a Paint App"

UNIT-III IMPROVING THE USER EXPERIENCE 9 hrs

Screen manager – selecting colours for the figures; Colour control on the canvas- colouring figures; stencil View-limiting the drawing space;scatter-multitouching to drag, rotate and scale; Recording gestures-line, circles and cross; Simple gestures-drawing with the finger, Behaviors-enhancing widget's functionality, style-decorating the interface, Factory-replacing a vertex instruction. Case study on "Kivy Networking"

UNIT-IV INVADERS REVENGE-AN INTERATIVE MULTITOUCH GAME 9 hrs

Invaders Revenge – an animated multitouch game; Atlas-efficient management of images; Boom-Simple sound effects, Ammo – Simple Animation; Invader – transitions for animations; Dock-automatic binding in the kivy language; Fleet-Infinite concatenation of animation; Scheduling events with the clock; Shooter-multitouch control; Invasion – moving the shooter with the keyboard; Combining animation with '+' and '&'.Case study on "Making a remote desktop APP".

UNIT-V KIVY PLAYER 9 hrs

Video-Play, pause and stop, Asyncimage- creating a cover for the video, Subtitles – tracking the video progression, Control bar- adding buttons to control the video, Slider-including a progression bar, Animation-hiding a widget, Kivy inspector-debugging interface, Actionbar-a responsive bar, LoadDialog-displaying a directory of files, scrollview-displaying a list of videos.Search-query the TED developer API. Case study on "Making the 2048 game".

TEXT BOOKS:

1. Kivy–Interactive Applications and Games in Python. Ulloa, Roberto. Packt Publishing Ltd, 2015.

2. Kivy: interactive applications in python. Ulloa, Roberto Packt Publishing Ltd, 2013.

3. Beginning Python Games Development: With Pygame. McGugan, Will, and Harrison Kinsley. Apress, 2015.

REFERENCE BOOKS:

1. A python book: Beginning python, advanced python, and python exercises. Kuhlman, Dave. Lutz:

Dave Kuhlman, 2009.

2. The quick Python book. Ceder, Naomi. Simon and Schuster, 2018.

3. Making Games with Python & Pygame. Sweigart, Al. 2012.

Mapping:

CO/POS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3											2	1
CO2	3	3	2	1	2								2	2
CO3	3	2	1	2	2								3	
CO4	3	2	1	-	2-								2	2
Average	3	2.5	1.33	1.5	2								2.25	1.66
Level of Correlation	3	3	1	2	2								2	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLO (AUTONOMOUS)

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

L	T	P	C
-	-	3	1.5

20ACS25 WEB TECHNOLOGIES LAB

Course Outcomes:

At the end 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:

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 I Semester (Common to CSE, IT, CSE (DS), CSE (AI & ML))

L	T	P	C
-	-	3	1.5

20ACS26 COMPUTER NETWORKS LAB

Course Outcomes:

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

1. Implement various routing protocols from different layers.
2. Design, implement and test an efficient algorithmic solution for the give problem
3. Use Network programming concepts in distributed applications.
4. Analyze different networking protocols and its modeling concepts to evaluate 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
C01	3	2	2		1								3	1
C02	3	3	3	3									3	1
C03	3												3	1
C04	3	3	3	2	2								3	2
Average	3	2.66	2.66	2.5	1.5								3	1.25
Level of Correlation	3	3	3	3	2								3	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

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

L	T	P	C
1	2	2	0

20AHS16 ADVANCED ENGLISH COMMUNICATION SKILLS

Course Outcomes:

After successful 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 Hours

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 Hours

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

UNIT-III 9 Hours

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

UNIT-IV 9 Hours

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 Hours

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

References:

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
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 & TECHNOLOGY (AUTONOMOUS)

III B. Tech I Semester (Common to All Branches)

L	T	P	C
2	0	0	0

20AHS21 INDIAN CONSTITUTION

Course Outcomes:

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

1. Understand the historical background of the constitution making and its importance forbuilding 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 IndiaServices and international institutions.

UNIT-I **5 Hours**

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

UNIT-II **5 Hours**

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 Hours**

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 Hours**

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 Hours**

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.

REFERENCE BOOKS:

1. Mahendra Pal Singh, V. N. Shukla, Constitution of India, Eastern Book Company, 2011.

2. J. N. Pandey, Constitutional Law of India - Central Law Agency, 1998

Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO 1	PSO2
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**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

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

L	T	P	C
2	0	0	0

20AHS17 QUANTITATIVE APTITUDE AND REASONING-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 Hours**

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 Hours**

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 Hours**

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

UNIT-IV **9 Hours**

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 Hours**

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

Text Books:

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

Mapping:

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

3-High Mapping 2- Medium Mapping 1- LowMapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

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

L	T	P	C
2	0	0	0

20AHS18 FRENCH LANGUAGE

Course Outcomes:

After successful 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 & sentencesin 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 Hours**

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 **8Hours**

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 Hours**

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 Hours**

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 Hours**

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.

Text Books:

1. CAMPUS 1 Method de Francais, Jacques Pecheur et Jacky Girardet, CLEInternational Paris 2002.
2. La France de toujours, Nelly Mauchamp; CLE international.
3. Sans Frontireres - Vols. 1, 2, & 3 – Hachette.

Reference Books:

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 Francaise – Hachette.

MAPPING:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

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

L	T	P	C
2	0	0	0

20AHS19 GERMAN LANGUAGE

Course Outcomes:

After successful 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-lifeconversation.
3. Analyze various sentence structures by examining the rules of grammar in speaking andwriting.
4. Demonstrate various verb structures of English and German languageeffectively in professional writing.

UNIT-I **10 Hours**

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 Hours**

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

UNIT-III **9 Hours**

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 Hours**

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 Hours**

GERMAN ADVANCED COMMUNICATION LEVEL – 1: The significance of language study, Speaking and thinking, Self – discovery, Communication, Language Competence, Language and culture, Language changes, Connection with other areas of study, The mother language and the other languages.

Text Books:

1. Korbinian, Lorenz Nieder Deutschals Fremdsprache IA. Ausländer, "GermanLanguage", Perfect Paperback Publishers, 1st Edition, 1992.
2. Deutschals Fremdsprache, IB, Erganzungskurs, "German Language", Front Cover.Klett, Glossar Deutsch-Spanisch Publishers, 1st Edition, 1981.

Reference Books:

1. Griesbach, "Moderner Gebrauch der deutschen Sprache", Schulz Publishers, 10thEdition, 2011.
2. Anna Quick, Hermann Glaser U.A, "Intermediate German: A Grammar andworkbook", Paperback, 1st Edition, 2006.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2					1				3				
CO2	2									3				
CO3	3					2				3				
CO4	2									3				
Average	2.25					1.5				3				
Level of correlation	2					2				3				

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

III B. Tech I Semester (Common to all Branches)	**L**	**T**	**P**	**C**
	2	**0**	**0**	**0**

20AHS20 JAPANESE LANGUAGE

Course Outcomes:

After successful 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 theJapanese culture and etiquette.

UNIT-I **8 Hours**

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 Hours**

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 Hours**

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 Hours**

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 Hours**

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

Mapping:

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

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

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, IOT systems 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, Python Packages 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 with Python – 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, Stamatis Karnouskos, "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
CO1	3	3											3	3
CO2	3	3	3		1								3	2
CO3	3	3	3		2								3	2
CO4	3	3	3										3	2
Average	3	3	3		1.5								3	2.25
Level of Correlation	3	3	3		2								3	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester (Common to CSE, IT)
III B.Tech II Semester (Professional Elective-II CSE(DS))

L	T	P	C
3	-	-	3

20ACS29 DATA WAREHOUSING AND DATA MINING

Course Outcomes:

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

1. Define concepts of Data Warehousing architecture and implementation.
2. Apply data preprocessing techniques using modern tools.
3. Apply association rule for market basket analysis.
4. Design and deploy appropriate classification and cluster high dimensional data for better organization of data.
5. Evaluate various mining techniques on complex data objects.

UNIT-I 8 hrs

Data Warehousing and Business Analysis: Data warehousing Components –Building a Data warehouse –Data Warehouse Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata – reporting – Query tools and Applications – Online Analytical Processing (OLAP) – OLAP and Multidimensional Data Analysis, ETL (Extract Transform-Load).

UNIT-II 9 hrs

Data Mining: Data Mining Functionalities – Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation, Architecture Of a Typical Data Mining Systems, Classification of Data Mining Systems. Association Rule Mining: Efficient and Scalable Frequent Item set Mining Methods – Mining Various Kinds of Association Rules – Association Mining to Correlation Analysis – Constraint, Based Association Mining.

UNIT-III 9 hrs

Classification and Prediction: Issues Regarding Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction – Accuracy and Error Measures – Evaluating the Accuracy of a Classifier or Predictor – Ensemble Methods – Model Section.

UNIT-IV

Cluster Analysis: Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods – Partitioning Methods – Hierarchical methods – Density, Based Methods – Grid, Based Methods – Model, Based Clustering Methods – Clustering High, Dimensional Data – Constraint, Based Cluster Analysis – Outlier Analysis.

UNIT-V

Mining Object, Spatial, Multimedia, Text and Web Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects – Spatial Data Mining – Multimedia Data Mining – Text Mining – Mining the World Wide Web.

Text Books

1. Jiawei Han, Micheline Kamber and Jian Pei"Data Mining Concepts and Techniques", Third Edition, Elsevier, 2011.

Reference Books

1. Alex Berson and Stephen J. Smith "Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill Edition, Tenth Reprint 2007.

2. K.P. Soman, Shyam Diwakar and V. Ajay "Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.

3. G. K. Gupta "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.

4. Pang,Ning Tan, Michael Steinbach and Vipin Kumar "Introduction to Data Mining", Pearson Education, 2007.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**											**3**	2
CO2	**3**	**3**	**1**	**1**	**2**								**3**	**2**
CO3	**3**	**2**	**2**										**3**	**1**
CO4	**3**	**3**	**3**	**2**	**2**								**3**	**2**
CO5	3	3	3	**2**	3								**3**	2
Average	**3**	**2.6**	**2.25**	**1. 66**	**2.33**								**3**	**1.8**
Level of Correlation	**3**	**3**	**2**	**2**	**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

L	T	P	C
3	-	-	3

20ACS30 ADVANCED STYLING WITH RESPONSIVE DESIGN

Course Outcomes:

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

1. Use responsive web page design and its advanced styling mechanism
2. Design an interactive web pages using HTML5 CSS and Media Queries
3. Create sites that behave across a range of platforms using Angular JS Frameworks
4. Acquire technical knowledge of Light Weight Frameworks.

UNIT –I 9hr

Introduction to Responsive Design: What Is Responsive Design - Responsive Design vs. Device-Specific Experiences -Responsive Web Design Is Not Limited Just to Mobile- When Would You Not Use Responsive Web Design- Understanding the Viewport- Understanding Breakpoints- Examples of Responsive Web Design. Looking at HTML5 Technologies- What's New in CSS3.Physical Devices, Open Devices Lab.

Testing a Responsive Site: Testing Responsive Design in the Browser- Testing on a Device Simulator.

UNIT –II 9hr

The Power of Media Queries: An Introduction to Media Queries- Using Media Queries in CSS- Mobile First vs. Desktop First- Targeting High Pixel Density Displays- Using Fluid Layouts- Types of Layouts- Principles When Working with a Fluid Design- Building a Fluid Design Using a CSS Grid.

UNIT –III 9hr

Frameworks in Responsive Design: Grid Systems- CSS Frameworks- Prototyping a Site Using a CSS Framework- Adapt Existing Styles and Scripts: Refactoring- Full Reskin- Tools and Workflow: Knowing Your Command Line- Version Control with Git- CSS Pre-processors'- Scaffolding- Workflow - Other Useful Tools.

UNIT –IV 9hr

Introduction to AngularJS: AngularJS Framework-Exploring the features of AngularJS-Role of AngularJS-The AngularJS Dynamic Routing-based Approach-The AngularJS Directive-based Approach- AngularJS scope inspector-Online and offline tools.

UNIT –V 9hr

Light weight alternatives: What Are Frameworks- Various Popular Frameworks- Bootstrap-Foundation-Materialize-Skeleton-Milligram -UIkit-Material Design Lite-Susy -Choosing a Framework -Concept of Grids-Building a Landing Page with Skeleton-Building a Product Page with Milligram-Introducing UIkit -Material Design Lite Explained-Susy Explained.

Text Books:

1. Jonathan Fielding - Beginning Responsive Web Design with HTML5 and CSS3-Apress (2014) (UNIT I, II,III)
2. Sandeep Kumar Patel - Responsive Web Design with AngularJS-Packt Publishing (2014) (UNIT IV)
3. Aravind Shenoy & Anirudh Prabhu - CSS Framework Alternatives Explore Five Lightweight Alternatives to Bootstrap and Foundation with Project Examples (UNIT V)

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**	**1**										**3**	1
CO2	**3**	**3**	**3**	**2**	**3**								**3**	**2**
CO3	**3**	**3**	**2**	**2**	**3**								**3**	**2**
CO4	**3**	**1**											**3**	1
Average	**3**	**2.25**	2	**2**	3								**3**	**1.5**
Level of Correlation	**3**	**2**	2	**2**	3								**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 [DS], CSE [AI&ML], Job oriented Elective-IIII B. TECH II-SEMESTER CSE, Professional Elective-II

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3	0	0	3

20ACD08 SINGLE PAGE WEB APPLICATIONS WITH ANGULARJS
(Job Oriented Elective – I)

COURSE OUTCOMES:

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

1. Explain the intermediate and advanced web development practices in JavaScript.
2. Identify the features and functional components of React for Web Development.
3. Find and use code packages of Node.js for creating cross-platform JavaScript runtime environment.
4. Analyze different APIs and Server Rendering features for displaying information onto the screen.

UNIT I INTRODUCTION TO ANGULARJS 9

Introduction-Development Environment Setup - Model-View-View-Model [MVVM]- AngularJS installation - Sharing Data with the View - Implementing Name Calculator - Custom HTML Attributes - Dependency Injection - Protecting Dependency Injection from Minification - Expressions and Interpolation.

UNIT II FILTERS, DIGEST CYCLE, CONTROLLER INHERITANCE AND CUSTOM SERVICES 9

Filters - Creating Custom Filters - Digest Cycle - 2-way, 1-way and 1 time binding, ng-repeat, Filtered ng-repeat - Prototypal Inheritance - Scope Inheritance - Controller as Syntax - Custom Services - Custom Services with. factory() - Custom Services with .provider().

UNIT III PROMISES, AJAX AND CUSTOM DIRECTIVES 11

Asynchronous Behavior with Promises and $q - Ajax with $http Service - Directives: Dynamic HTML - restrict Property - Directive's Isolate Scope: "=" and "@" - Using Controllers Inside Directives - Directive APIs and "&" - Manipulating the DOM with link - Using Directive's transclude to Wrap Other Elements.

UNIT IV COMPONENTS, EVENTS, MODULES, AND ROUTING 8

Components & Component-Based Architecture - AngularJS Event System- Modules-Routing -Routing State with Controller- Routing State with resolve - Routing State with URL Parameters - Routing State with Nested Views - Router State Transition Events.

UNIT V FORM VALIDATION AND TESTING 8

Form Validation-Testing Javascript with Jasmine- Testing AngularJS Controllers-Testing AngularJS Services and $http- Testing AngularJS Directives- Testing AngularJS Components - Visit with The Client-Non-AngularJS Website Overview-Restaurant Server Setup- Basic Structure of the Restaurant App - Coding Up a Loader/Spinner-Coding Up $http Interceptor-Coding Up Menu Categories View -Single Category View.

Total: 45 Hrs

TEXT BOOK

1. Pro MERN Stack, Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, APress Publisher, 2019.
2. Modern Full-stack Development, Frank Zammetti, Apress, 2020.

REFERENCES

1. Advanced Web Development with React, Mehul Mohan, bpb publisher, 2020.

2. Dayley B. Node. js, MongoDB, and AngularJS web development. Addison-Wesley Professional; 2014.
3. Freeman, Adam. Pro AngularJS. Apress, 2014.

WEB REFERENCE

- https://in.coursera.org/learn/single-page-web-apps-with-angularjs
- http://tutorialsteacher.com
- https://reactjs.org/
- https://nodejs.org
- www.Expressjs.com
- www.mongodb.com

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**3**									**3**	**1**
CO2	**3**	**2**	**3**		**1**							**3**	**2**
CO3	**3**	**3**	**3**		**2**							**3**	**2**
CO4	**3**	**2**	**3**		**2**							**2**	**2**
Average	**3**	**2.5**	**3**		**1.66**							**2.75**	**1.75**
Level of Correlation	**3**	**3**	**3**		**2**							**3**	**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)
IV B.Tech I Semester ME(Open Elective-IV)

L	T	P	C
3	-	-	3

20ACS31 **ETHICAL HACKING**
(Professional Elective -II)

Course Outcomes:

After completion of the course the student will able to do

1. Understand the basics of ethical hacking, system hacking and viruses.
2. Understand the concepts of sniffers, DOS and session hijacking.
3. Understand the fundamentals of web and wireless network hacking.
4. Apply the different types of security and cryptography techniques.

UNIT I - Introduction to Hacking, Gathering Target, Network and Host Information 9 hrs

Defining ethical hacking – How to be ethical – Keeping it legal - **Reconnaissance** - Information-gathering methodology - Social engineering – Scanning - Enumeration

UNIT II - System Hacking, Trojans, Backdoors, Viruses, and Worms 9 hrs

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 – Sniffers, Denial of service and Session hijacking 9 hrs

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 – Web Hacking, Attacking Applications, Wireless Network Hacking 9hrs

How Web Servers Work - Types of Web Server Vulnerabilities - Web Application Vulnerabilities - Web-Based Password-Cracking Techniques - SQL Injection - Buffer Overflows - Wi-Fi and Ethernet - Authentication and Cracking Techniques - Using Wireless Sniffers to Locate SSIDs - MAC Filters and MAC Spoofing - Rogue Access Points - Wireless Hacking Techniques - Securing Wireless Networks

UNIT V - Physical Site Security, Bypassing Network Security, Cryptography- 9hrs

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.

REFERENCE BOOKS:

1. Dafydd Stuttard, Marcus Pinto, The Web Application Hacker's Handbook, Second Edition, Wiley publications.
2. Jon Erickson, Hacking the Art of Exploitation, Second Edition, No Starch Press.
3. Michael T. Simpson, Kent Backman, and James E. Corley, Hands-On Ethical Hacking and Network Defense, Course Technology PTR A part of Cengage Learning
4. Patrick Engebretso, The Basics of Hacking and Penetration Testing Ethical Hacking and Penetration Testing Made Easy, Syngress Press

MAPPING

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester
(CSE)

L	T	P	C
3	-	-	3

20ACS32 **Distributed Operating Systems**
(Professional Elective -II)

COURSE OUTCOMES:

1. Know the architecture of 8086 microprocessors
2. Understand the programming & Instruction set of 8086 microprocessors
3. Illustrate principles and importance of distributed operating system
4. Implement distributed client server applications using remote method invocation
5. Distinguish between centralized systems and distributed systems

UNIT I - FUNDAMENTALS OF DISTRIBUTED SYSTEMS 11 Hrs

Introduction to Distributed Computing System- Evolution of Distributed Computing Systems- Distributed Computing System Models - Gaining Popularity of Distributed Computing Systems- Distributed Operating System- Issues in Designing a Distributed Operating System- Introduction to Distributed Computing Environment (DCE) - Computer Networks – Introduction - Networks Types - LAN Technologies - WAN Technologies - Communication Protocols – Internetworking - ATM Technology

UNIT II - COMMUNICATION IN DISTRIBUTED SYSTEMS 9 Hrs

Message Passing- Introduction- Desirable Features of a Good Message-Passing System - Issues in IPC by Message Passing - Synchronization- Buffering- Multidatagram Messages - Encoding and Decoding of Message Data - Process Addressing - Failure Handling - Group Communication - Case Study: 4.38SD UNIX IPC Mechanism

UNIT III – MEMORY AND SYNCHRONIZATION 11 Hrs

General Architecture of DSM Systems - Design and Implementation Issues of DSM – Granularity - Structure of Shared Memory Space - Replacement Strategy – Thrashing - Other Approaches to DSM - Heterogeneous DSM - Advantages of DSM - Advantages of DSM - Event Ordering - Mutual Exclusion – Deadlock - Election Algorithms

UNIT IV – RESOURCE, PROCESS MANAGEMENT AND NAMING 10 Hrs

Desirable Features of a Good Global Scheduling Algorithm - Task Assignment Approach - Load-Balancing Approach - Load-Sharing Approach - Process Migration - Threads - Desirable Features

of a Good Naming System - Fundamental Terminologies and Concepts - System-Oriented Names - Object-Locating Mechanisms - Human-Oriented Names - Name Caches - Naming and Security

UNIT V - DISTRIBUTED FILE SYSTEMS AND SECURITY 8 Hrs

Desirable Features of a Good Distributed File System - File Models - File-Accessing Models - File-Sharing Semantics - File-Caching Schemes - File Replication - Fault Tolerance - Atomic Transactions - Design Principles - Potential Attacks to Computer Systems – Cryptography – Authentication - Access Control - Digital Signatures - Digital Signatures - Design Principles.

TEXT BOOKS:

1. Pradeep K. Sinha, "Distributed Operating Systems Concepts and Design", PHI, 2007

REFERENCE BOOKS:

1. Andrew S. Tannenbaum, Maarten Van Steen, "Distributed Systems- Principles and Paradigms" , Second Edition, PHI, 2007

MAPPING:

	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	**3**	**2**											**3**	**1**
CO2	**3**	**3**	**1**										**3**	1
CO3	**3**	**3**	**3**										**3**	**1**
CO4	**3**	**3**											**1**	**1**
Average	**3**	**2.75**	**2**										**2.5**	**2**
Level of Correlation	**3**	**3**	**2**										**3**	**2**

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester
(CSE)

L	T	P	C
3	-	-	3

20ACS33 ARTIFICIAL INTELLIGENCE
(Professional Elective -II)

COURSE OUTCOMES:

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

1. Understand the fundamentals of Artificial Intelligence (AI).
2. Analyze the basic concepts of problem solving, searching, inference, perception using AI.
3. Apply basic principles of AI in solutions that require real world knowledge representation and learning.
4. Create the real life examples of Artificial Intelligence.

UNIT I INTRODUCTION 9 Hrs

History of AI – the Present State of AI– Definition of AI – Examples Tasks, Phases of AI– Uniform Search: Notion of a State– Search Problem and Examples – Basic Search Strategies - -Iterative Deepening DFS - Bidirectional Search

UNIT II PROBLEM SOLVING METHODS 9 Hrs

Problem solving Methods – Search Strategies- Uninformed – Informed – Heuristics – Local Search Algorithms and Optimization Problems – Searching with Partial Observations – Constraint Satisfaction Problems – Constraint Propagation – Backtracking Search – Game Playing – Optimal Decisions in Games – Alpha – Beta Pruning – Stochastic Games.

UNIT III KNOWLEDGE REPRESENTATION 9 Hrs

Logic in AI– Different Knowledge Representation systems – Syntax – Semantics– Forward Chaining– Resolution– Reduction to Satisfiability Problem– SAT Solvers : DPLL Algorithm – Walk SAT Algorithm – Uncertainty in AI: Motivation – Basics of Probability – Conditional Independence & Bayes Rule.

UNIT IV SOFTWARE AGENTS 9 Hrs

Agents and Environments - Decision Theory - Probabilistic Uncertainty - Expected Utility vs Expected Value - Markov Decision Processes - Bayesian Networks: Syntax – Syntax - Conditional

Independences and d-Separation - Inference using Variable Elimination - Reducing 3-SAT to Bayes Net - Rejection Sampling - Likelihood Weighting - MCMC with Gibbs Sampling - Maximum Likelihood Learning - Structure Learning and Expectation.

UNIT V LEARNING METHODOLOGIES 9 Hrs

Reinforcement Learning: Background – Model-based Learning for policy – free Learning for policy evaluation – TD Learning and Computational – Q Learning - Exploration vs Exploitation Tradeoff – Generalization in RL - Deep Learning : Perceptions and Activation functions– Example of Handwritten digit recognition – Neural Layer as matrix operations – Differentiable loss function – Back propagation - Convolutional Neural Networks - Deep Reinforcement Learning – Ethics of AI.

TEXT BOOK

1. Mausam, IIT Delhi. An Introduction to Artificial Intelligence.

REFERENCES

1. S.Russel and P.Norvig,"Artificial Intelligence: A Modern Approach", Prentice Hall, Third Edition, 2009.
2. I Bratko,"Prolog: Programming for Artificial Intelligence", Fourth Edition Addision – Wesley Educational Publishers Inc., 2011.

MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3												1	1
CO2	3	3	2										3	2
CO3	3	3	2										3	2
CO4	3	3	3	2									3	
Average	3	3	2.33	2									2.5	1.66
Level of Correlation	3	3	3	2									3	2

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

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

L	T	P	C
3	-	-	3

20AIT12 OBJECT ORIENTED ANALYSIS AND DESIGN
(Professional Elective -II)

COURSE OUTCOMES:

1. Express software design with UML diagrams
2. Design software applications using OO concepts.
3. Identify various scenarios based on software requirements
4. Transform UML based software design into pattern-based design using design patterns
5. Understand the various testing methodologies for OO software

UNIT I UNIFIED PROCESS AND USE CASE DIAGRAMS

Introduction to OOAD with OO Basics - Unified Process – UML diagrams – Use Case –Case study – the Next Gen POS system, Inception -Use case Modeling – Relating Use cases – include, extend and generalization –Case study Use-cases

UNIT II STATIC UML DIAGRAMS

Class Diagram— Elaboration – Domain Model – Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class Hierarchies – Aggregation and Composition - Relationship between sequence diagrams and use cases – Case studyClass Diagrams

UNIT III DYNAMIC AND IMPLEMENTATION UML DIAGRAMS

Dynamic Diagrams – UML interaction diagrams - System sequence diagram – Collaboration diagram – When to use Communication Diagrams - State machine diagram and Modeling –When to use State Diagrams - Activity diagram – When to use activity diagrams Implementation Diagrams - UML package diagram - When to use package diagrams -Component and Deployment Diagrams – Case study Component and Deployment diagrams

UNIT IV DESIGN PATTERNS

GRASP: Designing objects with responsibilities – Creator – Information expert – Low Coupling – High Cohesion – Controller Design Patterns – creational – factory method – structural – Bridge – Adapter – behavioural – Strategy – observer –Applying GoF design patterns – Mapping design to code

UNIT V TESTING

Object Oriented Methodologies – Software Quality Assurance – Impact of object orientation onTesting – Develop Test Cases and Test Plans

TEXT BOOKS:

1. Craig Larman, ―Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development‖, Third Edition, Pearson Education, 2005.
2. Ali Bahrami - Object Oriented Systems Development - McGraw Hill International Edition - 1999

REFERENCES:

1. Erich Gamma, and Richard Helm, Ralph Johnson, John Vlissides, ―Design patterns: ElementsOf Reusable Object-Oriented Software‖, Addison - Wesley, 1995.
2. Martin Fowler, ―UML Distilled: A Brief Guide to the Standard Object Modeling Language,Third edition, Addison Wesley, 2003

MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	2	3	2								3	1
CO2	3	2	1	2	1								3	1
CO3	2	2	2	3	1								3	
CO4	1	2	1	2	1								3	
CO5	1	2	1	2	1								2	1
Average	1.6	1.8	1.4	2.4	1.2								2.8	1.5
Level of Correlation	2	2	2	3	2								3	2

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

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

20AEC45 MICROPROCESSORS AND INTERFACING
(Open Elective -II)

Course Outcomes:

After Successful 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 programable 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 LANGUAGEPROGRAMMING 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 anarray, 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 operationand interfacing to 8086, Stepper Motor interfacing, D/A &A/D converter, traffic light controller

UNIT-IV ADVANCED MICROPROCESSORS

Introduction to 80286, Salient Features of 80386, Real and Protected Mode Segmentation & Paging, Salient Features of Pentium, Branch Prediction and Overview of RISC Processors

UNIT V INTRODUCTION TO MICROCONTROLLERS

overview of 8051 microcontroller, Architecture, I/O ports, Memory organization, addressing modes and instruction set of 8051, Simple programs.

TEXT BOOKS:

1. Advanced Microprocessor and Peripherals, A.K.Ray and K.M.Bhurchandi, TMH, 2000.
2. Micro Controllers, Deshmukh, Tata McGraw Hill Edition,2005.

REFERENCE BOOKS:

1. Micro Processors & Interfacing, Douglas V. Hall, 2007.
2. The 8088 and 8086 Micro Processors Walter, A.Triebel & Avtar Singh, 4th Edition – PHI, 2003.
3. Micro Computer System 8086/8088 Family Architecture, Programming and Design, Liu and G.A. Gibson, 2nd Edition, PHI, 1987.

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**										

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

	L	T	P	C
	3	-	-	3

20AMB09 **INTELLECTUAL PROPERTY RIGHTS**
(Open Elective -II)

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 thepurposes 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 lawcontext.

UNIT - I: UNDERSTANDING AND OVERVIEW OF IPR: Introduction- meaning-nature- forms of intellectual property- types of intellectual property-industry property-International conventions.

UNIT-II: COPYRIGHT ACT, 1957: Meaning –Nature and object of copyright-origin and development of copyright law in India-salient features of copyright act,1957-Definitons- originality material-rights of reproduction.

UNIT-III: TRADEMARKS ACT, 1999: Salient features of Trademarks Act, 1999-Meaning-objectives and functions of trademark-Definition of Trademark- trademark protection- - acquisition of Trademark rights-protectable matter-trademark registration process.

UNIT-IV: PATENT ACT, 1970: Meaning –definition of patent-history and concept of patent law-salient features of the patent act- Definition-kinds of patents and advantages-rights and obligations of patentee- Process of obtaining a patent.

UNIT-V: DESIGNS ACT, 2000: Meaning –definition- Salient features of Designs-Registration of Designs-Rights granted to design holders -Infringement of Design.

TEXT BOOKS:

1. Narayanan, P.(Revised 2017, Reprint 2018).Patent Law. Eastern Law House.
2. Acharya, N.K. (2021). Intellectual Property Rights: Scandinavian Languages Edition.
3. Chowdhary, R., S.K. & Other. Law of Trademark, Copyrights, Patents and Designs.
4. Reddy, G.B., Intellectual Property Rights and the Law, Gogia Law Agency.
5. Holyoak, J. &Torremans, P. Intellectual Property Law.

REFERENCES:

1. Bouchoux, E.B. Intellectual Property Rights, Cengage Learning.
2. Ganguli, P. Intellectual Property Rights– Unleash my Knowledge Economy. 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			

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

III B.Tech II Semester (Common to CSE,CSD,CSM, CE, & IT)(OE-II)

III B.Tech II Semester ME(PE-II)

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, 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 Hours

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 Hours

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 Hours

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 Hours

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 Hours

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.

Reference Books

1. Hiller & Liberman, Introduction to Operations Research, Noida RC, 7th Edition,Tata Mc Graw Hill publication
2. R. Panneerselvam, Operations Research, New Delhi, 2nd Edition, Prentice Hall International Publisher, 2006

Mapping

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

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

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

L	T	P	C
3	-	-	3

20ACM13 BUSINESS INTELLIGENCE
(Job Oriented Elective -II)

Course Outcome
On completion of the course, student will be able to:

1. Explain the basics of Analytics and Business Intelligence.
2. Define Framework elements, Phases and Development stages in Business Intelligence Life Cycle.
3. Analyze the issues and critical challenges in Business Intelligence for creating user friendly BI solutions.
4. Determine different BI strategies for planning and implementing effective BI solutions.

Unit -I Introduction to Business Intelligence 9hrs

Introduction-Data, Information Vs Intelligence- Components of Business Intelligence Architecture-Business Query and Reporting- A Business view of the Data-Production Reporting-Online Analytical Processing (OLAP)-Microsoft Office-dashboards-Scorecards- Analytic Applications-Measures of BI Success -Emerging BI Modules.

Unit -II Business Intelligence Life Cycle 9hrs

Introduction, Business Intelligence Lifecycle, Enterprise Performance Life Cycle (EPLC) Framework Elements, Life Cycle Phases, Human Factors in BI Implementation, BI Strategy, Objectives and Deliverables, Transformation Roadmap, Building a transformation roadmap, BI Development Stages and Steps, Parallel Development Tracks, BI Framework.

Unit-III Business Intelligence User Model 9hrs

Introduction, Evolution of Business Intelligence, Business Intelligence Opportunity Analysis Overview, Content Management System, End User Segmentation, Basic Reporting and Querying, Online Analytical Processing, OLAP Techniques, OLAP Applications, Applying the OLAP to Data Warehousing, Benefits of using OLAP, Dashboard, Advanced/Emerging BI Technologies, Future of Business Intelligence.

Unit-IV Business Intelligence Issues and Challenges 9hrs

Critical Challenges for Business Intelligence success, Cross-Organizational Partnership, Business Sponsors, Dedicated Business Representation, Availability of Skilled Team Members, Business

Intelligence Application Development methodology, Planning the BI Projects, Business Analysis and Data Standardization, Affect of Dirty Data on Business profitability, Importance of Meta-Data, Silver Bullet Syndrome, Customer Pain Points, Creating Cost Effective Enterprise friendly BI solution

Unit-V Business Intelligence Strategy and Road Map 9hrs

Planning to implement a Business Intelligence Solution, Understand Limitations of Business Intelligence, Business Intelligence Usage, Best use of Business Intelligence, The Advantages of BI with Sales- BI used for the rescue, Organization Culture, Managing Total Cost of Ownership for Business Intelligence, Total Cost of Ownership and Business Intelligence, Managing the TCO of the Business Intelligence, Factors that Affect Total Cost of Ownership.

Total=45Hrs

Text books

1. Efraim Turban, Ramesh Sharda, Dursun Delen, "Decision support and Business Intelligence Systems", Pearson-9th Edition, 2011.
2. Cindi Howson, "Successful Business Intelligence", Tata McGraw-Hill Edition,2008.

Reference Books

1. Grossmann W, Rinderle-Ma," Fundamental of Business Intelligence", Springer, 2015.
2. Foster Provost and Tom Fawcett, "Data Science for Business: What you need to know about data mining and data analytic thinking",2013.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2										3	2
CO2	3	3	1										3	3
CO3	3	3	1										2	2
CO4	3	3	2										3	1
Average	3	3	1.5										2.75	2
Level of correlation	3	3	2										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
III B.Tech II Semester ME(Open Elective-II)

L	T	P	C
3	-	-	3

20ACS34 MACHINE LEARNING

(Job Oriented Elective -II)

COURSE OUTCOMES:

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

1. Understand the concept of Machine Learning and its classification.
2. Apply classification techniques to solve real world problems.
3. Apply artificial neutral network models to solve complex problems.
4. Apply Bayesian learning using bayes theorem, naive bayes classifier
5. Apply and evaluate the unsupervised machine learning models through various clustering algorithms and Reinforcement learning.

UNIT I 9hrs

Introduction to machine learning- Supervised Learning- Unsupervised Learning - Reinforcement Learning - Probability Basics - Linear Algebra.

Statistical Decision Theory - Regression - Statistical Decision Theory – Classification- Bias-Variance- Linear Regression - Multivariate Regression-Dimensionality Reduction- Subset Selection - Shrinkage Methods - Principal Components Regression - Partial Least Squares

UNIT II 9hrs

Linear Classification - Logistic Regression- Linear Discriminant Analysis – Optimization- Perceptron Learning - SVM - Formulation - SVM - Interpretation & Analysis - SVMs for Linearly Non Separable Data - SVM Kernels - SVM - Hinge Loss Formulation

UNIT III 9hrs

Artificial Neural Network- Early Models - Backpropagation I - Initialization, Training & Validation- Maximum Likelihood Estimate - Priors & MAP Estimate - Bayesian Parameter Estimation- Regression Trees- Stopping Criteria & Pruning- Loss Functions for Classification - Categorical Attributes - Multiway Splits - Missing Values, Imputation & Surrogate Splits - Instability, Smoothness & Repeated Subtrees.

UNIT IV 9hrs

Evaluation Measures - Bootstrapping & Cross Validation - Class Evaluation Measures- The ROC Curve - Minimum Description Length & Exploratory Analysis- Introduction to Hypothesis Testing - Basic Concepts - Sampling Distributions & the Z Test - Student\'s t-test - The Two Sample &

Paired Sample t-tests - Confidence Intervals- Bagging, Committee Machines & Stacking – Boosting- Gradient Boosting - Random Forest-- Naive Bayes - Bayesian Networks - Undirected Graphical Models - Introduction --Undirected Graphical Models - Potential Functions - Hidden Markov Models - Variable Elimination.

UNIT V 9hrs

Belief Propagation- Partitional Clustering- Hierarchical Clustering - Threshold Graphs - TheBIRCH Algorithm - The CURE Algorithm- Density Based Clustering- Gaussian Mixture Models - Expectation Maximization- Expectation Maximization Continued- Spectral Clustering- Learning Theory- Frequent Item set Mining - The Apriori Property- Introduction to Reinforcement Learning- RL Framework and TD Learning - Solution Methods & Applications - Multi-class Classification.

Text Books

1. Introduction to Machine Learning by Prof. Balaraman Ravindran, Computer Science and Engineering, IIT Madras
   https://drive.google.com/file/d/1pJAMtgwNyfhVnP9nrQv_yVcrm6cBNLJH/view
2. Introduction to Machine Learning Edition 2, by Ethem Alpaydin
3. Marco Gori , Machine Learning: A Constraint-Based Approach, Morgan Kaufmann. 2017

References

1.Introduction to Machine Learning,Third Edition, by Kubát & Miroslav,2nd edition.

Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO1	PSO2
CO1	3	2	2										3	3
CO2	3	3	3										2	1
CO3	3	2		2									3	2
CO4	3	3	2	1									2	1
CO5	3	3	3	3									3	
Average	3	2.6	2.5	2									2.6	1.75
Level of Correlation	3	3	3	2									3	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)

L	T	P	C
-	-	3	1.5

20ACS35 DATA WAREHOUSING AND DATA MINING LAB

Course outcomes:

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

1. Identify different attributes of credit assessment and develop a decision tree.
2. Derive associations from dataset and do clustering using weka.
3. Develop appropriate solutions using classification algorithms.

LIST OF EXPERIMENTS

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient. To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.

2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.

3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.

4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application. The German

Credit Data:

Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such data set, consisting of 1000 actual cases collected in Germany. Credit dataset (original) Excel spreadsheet version of the German credit data (Down load from web).

In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer !)

A few notes on the German dataset

• DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).

• owns telephone. German phone rates are much higher than in Canada so fewer people own telephones.

• foreign_worker. There are millions of these in Germany (many from Turrkey). It is very hard to get German citizenship if you were not born of German parents.

• There are 20 attributes used in judging a loan applicant. The goal is the classify the applicant into one of two categories, good or bad. **Subtasks : (Turn in your answers to the following tasks)**

1. List all the categorical (or nominal) attributes and the real, valued attributes separately.

2. What attributes do you think might be crucial in making the credit assessment? Come up with some simple rules in plain English using your selected attributes.

3. One type of model that you can create is a Decision Tree , train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.

4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy?

5. Is testing on the training set as you did above a good idea? Why or Why not?

6. One approach for solving the problem encountered in the previous question is using cross validation? Describe what cross, validation is briefly. Train a Decision Tree again using cross, validation and report your results. Does your accuracy increase/decrease? Why?

7. Check to see if the data shows a bias against "foreign workers" (attribute 20),or" personal, status" (attribute 9). One way to do this (perhaps rather simpleminded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in data mining tool. Did removing these attributes have any significant effect? Discuss.

8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the Arff data file to get all the attributes initially before you start selecting the ones you want.)

9. sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifications equally in both cases, give a higher cost to the first case (say cost 5) and lower

cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross, validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?

10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model?

11. You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning, Explain this idea briefly. Try reduced error pruning for training your Decision Trees using crossvalidation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase?

12. (Extra Credit): How can you convert a Decision Tree into "if,then,else rules". Make up your own small Decision Tree consisting of 2,3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules , one such classifier in data mining tools is rules.PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one ! Can you predict what attribute that might be in this dataset? One R classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained bytraining a one R classifier. Rank the performance of j48, PART and one R.

13. Derive association rules from the following dataset.

Outlook	Temperature	Humidity	Windy	Play
Sunny	Hot	High	False	No
Sunny	Hot	High	True	No
Overcast	Hot	High	False	Yes
Rainy	Mild	High	False	Yes
Rainy	Cool	Normal	False	Yes
Rainy	Cool	Normal	True	Yes
Overcast	Cool	Normal	True	Yes
Sunny	Mild	High	False	No
Sunny	Cool	Normal	False	Yes
Rainy	Mild	Normal	False	Yes
Sunny	Mild	Normal	False	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Rainy	Mild	High	True	No

14. Perform Clustering on Weather nominal data set

i. Open data mining tool and Load the data set editor. Get familiarize with the editor operations.

a. Load the weather. Nominal dataset. Use the filter, Unsupervised, instance. Remove with Values to remove all instances in which the humidity attribute has the value high. To do this, first make the field next to the Choose button show the text Remove with Values. Then click on it to get the Generic Object .Editor window, and figure out how to change the filter settings appropriately.

ii. Choosing k,means clustering algorithm for clustering use the Weather nominal data set (.arff) performs clustering with a Euclidean distance functions and visually inspect the nature of the clusters.

15. Classification: Choosing an appropriate filter for classification use the Weather nominal data set (.arff) perform classification and visualize the classification tree.

Task Resources:

Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)

- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**							**1**				**3**	**1**
CO2	**3**	**3**	**2**	**1**	**3**								**3**	**1**
CO3	**3**	**3**	**3**	**2**	**3**								**3**	
Average	**3**	**2.66**	**2.5**	**1.5**	**3**				**1**				**3**	**1**
Level of Correlation	**3**	**3**	**3**	**2**	**3**				**1**				**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

L	T	P	C
-	-	3	1.5

20ACS36 ADVANCED STYLING WITH RESPONSIVE DESIGN LAB

Course outcomes:

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

1. Demonstrate mobile-first paradigm and the importance of wireframes in the design phase.
2. Solve real time problems using Existing & evolving Frameworks.
3. Create Challenging & Interactive Webpages to work independently and in teams.

LIST OF EXPERIMENTS

1. Practicing mobile-first development in wireframes

Creating three website wireframes for these dimensions: smartphone, tablet, and desktop, by applying the mobile-first concept.

2a. Creating the layout design for wireframes

2b.Using Foundation4 Grid to structure the website

Using the Foundation4 Grid, perform the following recommended steps:

1. Start coding the HTML script.

2. Identify the rows in the structure and add a row class to the existent element or to a new div tag.

3. Measure how many columns each main element will fill and set this value in the classes.

3. Customizing menu using the toggle menu solution

4. Creating different image versions for featured homepage images

5. Creating an image slider using the Swiper plugin

6. Creating a responsive table of prices using the FooTable jQuery plugin

7. Creating a contact form using the Ideal Forms framework

8. Installation of Bower- Grunt and Gulp (Execute simple Exercises)

9 Building a Landing Page with Skeleton

10. Building a Product Page with Milligram

11. Creating a 4×3 Responsive Grid Layout-Susy

12. Building an Intuitive Web Page Using MDL

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**											**3**	
CO2	**3**	**3**	**2**	**2**	**2**								**3**	
CO3	**3**	**1**							**2**				**3**	
Average	**3**	**2**	**2**	**2**	**2**				**2**				**3**	
Level of Correlation	**3**	**2**	**2**	**2**	**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
(Common to CSE, IT)

L	T	P	C
-	-	3	1.5

20ACS37 Internet of Things Lab

Course Outcomes:

1. Apply IoT based Technology to solve real time problems.
2. Identify Hardware and software required to design and build IoT.
3. Interface with sensors and actuators, other IoT devices, and cloud servers
4. Design and develop program Mobile Computing device to access IoT data from cloud and to interact with devices.

LIST OF EXPERIMENTS

1 Connect Arduino board and glow LED, Read analog and digital sensors such as relay, temperature, Humidity.

2 Load the OS in Raspberry pi,

3 Interface with Bluetooth and transmit sensor data to other node

4 Interface with ZigBee and transmit sensor data to other node

5 Interface with 6LoWPAN and transmit sensor data to other node

6 Store sensor data in cloud

7 Mobile app to display cloud data

8 Measure the light intensity in the room and output data to the web API

9 Control your home power outlet from anywhere using raspberry pi, zigbee and arduino

10 Build a smart Home Automation Application.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2											3	
CO2	3	3	2		2				2				3	2
CO3	3	1							2				3	
CO4	3	3	2	1					2				3	2
Average	3	2.25	2	1	2				2				3	2
Level of Correlation	3	2	2	1	2				2				3	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, CSE (DS),CSE(AI &ML))

L	T	P	C
1	-	2	2

20ACD22 **SHELL PROGRAMMING (Skill Course)**

Course outcome:

1. Explain the basics of UNIX Architecture and different she utilities.
2. Identify different SHELL environment and utilities supporting for filter operations.
3. Apply the regular expression features and different operations on SED and AWK.
4. Analyze the various Shell programming features of Korn shell and C shell.

LIST OF EXPEERIMENTS

Week-1

Session-1

a) Log into the system

b) Use vi editor to create a file called myfile.txt which contains some text.

c) correct typing errors during creation.

d) Save the file

e) logout of the systemSession-2

a) Log into the system

b) open the file created in session 1

c) Add some text

d) Change some text

e) Delete some text

f) Save the Changes

g) Logout of the system

Week-2

a) Log into the system

b) Use the cat command to create a file containing the following data. Call it mytable use tabs to separate the fields.

1425 Ravi 15.65

4320 Ramu 26.27

6830 Sita 36.15

1450 Raju 21.86

c) Use the cat command to display the file, mytable.

d) Use the vi command to correct any errors in the file, mytable.

e) Use the sort command to sort the file mytable according to the first field. Call thesorted file mytable

f) Print the file mytable

g) Use the cut and paste commands to swap fields 2 and 3 of mytable. Call it mytable

h) Print the new file mytable

i) Logout of the system.

Week-3

1) a) Login to the system

b) Use the appropriate command to determine your login shell

c) Use the /etc/passwd file to verify the result of step b.

d) Use the who command and redirect the result to a file called myfile1. Use the more command to see the contents of myfile1.

e) Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2. Use the more command to check the contents of myfile2.

2) a) Write a sed command that deletes the first character in each line in a file.

1. Write a sed command that deletes the character before the last character in each line ina file.

2. Write a sed command that swaps the first and second words in each line in a file.

Week-4

1. Pipe your /etc/passwd file to awk, and print out the home directory of each user.
2. Develop an interactive grep script that asks for a word and a file name and then tellshow many lines contain that word. Repeat Part using awk

Week-5

a) Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.

b) Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.

Week-6

a) Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers.

b) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

Week-7

a) 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.

Week-8

a) Write an interactive file-handling shell program. Let it offer the user the choice of copying, removing, renaming, or linking files. Once the user has made a choice, have the program ask the user for the necessary information, such as the file name, new name and so on.

b) Write shell script that takes a login name as command – line argument and reports when that person logs in.

Week-9

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

b) Develop an interactive script that ask for a word and a file name and then tells how many times, that word occurred in the file.

Week-10

Write a shell script to perform the following string operations:

i) To extract a sub-string from a given string.

ii) To find the length of a given string

Text Books:

1. Unix and shell Programming,1st Edition, Behrouz A.Forouzan – Richard F.Gilbery,2003, Cengage Learning India.
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, 2006, TMH.

References:

1. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, 2008, Pearson Education.
2. Advanced Unix programming, 2nd Edition, N.B Venkateswarlu, 2010, BS Publications.
   Unix Shell programming, 1st Edition, YashwanthKanitkar, 2010, BPB Publisher.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2									-	3	2
CO2	3	3	2		2							-	3	1
CO3	3	3	2		2							2	3	2
CO4	3	3	2		2							2	3	2
Average	3	3	2		2							1	3	1.75
Level of Correlation	3	3	2		2							1	3	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 all branches) **L T P C**
2 0 0 0

20AHS23 ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE

Course Outcomes:

At the end 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.

Reference Books:

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/

Mappping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3					3	3							
CO2	2					3	3							
CO3						3	3							
CO4	3					3	3							
Average	2.67					3	3							
Level of correlation	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))

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 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 (AI&ML), CSE (DS), CAI, CSC & CSO)

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 theorganizations.
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 inorganizations.
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 and Conflict, Power and Conflict; Coercion, Trait Approach, Ohio State Leadership Study, The University of Michigan Study, Blake and Mouton's Managerial Grid.

Unit III- Leadership theories and styles: Contingency Theories of Leadership -, The Path-Goal Theory, Transactional Leadership Style Charismatic Leadership. Servant Leadership, Leadership Ethics.

Unit IV- Fostering Organizational Culture and Climate: Vision Building; Developing Strategic Thinking; strategies in developing a culture conducive to change; handling change; Cultural Factors Influencing Leadership Practice.

Unit V- Developing Future Leaders: Strategic Leadership Competencies; 360º Leadership Assessment; The Myers–Briggs Type Indicator (MBTI); developing global 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 correlation									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 (AI&ML) & CSE (DS))

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 on IPR.**

Text Books:

1. Kapoor, N. D. (1983). Elements of mercantile law: including company law and industrial law. Sultan Chand & Sons.
2. Kunwar Arora, Vibha Arora. (2017). Law for Engineers. Central Law Publications.

Reference Books:

1. Gulshan, S. S. (2009). Business law. Excel Books.

2. Mulheron, R. (2020). Principles of Tort Law. Cambridge University Press.

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 correlation	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, CSC & CSO)

	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 EngineeringProcess – Definition and goal of Reverse engineering (RE); Theory of inventive problem solving (TRIZ): Fundamentals, methods and techniques, inventive design strategies and Simulation in Engineering Design - Computer Aided Engineering and Simulation; Engineering Manufacturing and Materials; Sustainability and Design: Recyclability;Reliability and Lean Design Engineering; Interface with Industrial design; Economic considerations in design; Eco Design and Green Engineering Product Development

UNIT – IV: FINANCIAL AND LEGAL ASPECTS OF BUSINESS: Process for effective

financial planning, types of budgets preparation, overview of specific ratios to measure financial performance, liquidity, asset management, profitability, leverage and comparative analysis, business laws enshrined in the Indian constitution, the policies of the state, Income tax structure, the labor laws.

UNIT –V: MANAGEMENT OF GROWTH VENTURE: Importance of Innovation as a differentiator in growth venture, Underlying opportunities, Strategic management for Launching process of growth ventures, understanding organizational & institutional aspects of growth ventures, Exit strategies of Growth ventures, Future prospects of venture financing of growth venture firms.

TEXT BOOKS:

1. Allen, K. R. (2018). Launching New Ventures: An EntrepreneurialApproach. 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 toEnterprise. 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). ValueProposition Design: How to Create Products and Services Customers Want. Germany: Wiley.
3. Allen, K. R. (2010). Entrepreneurship for Scientists and Engineers. UnitedKingdom: 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 (AI&ML) & CSE (DS))

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 and Theory Y, Leadership Styles .

UNIT-II INTRODUCTION TO ORANISATION: Types of Mechanistic and organic structures. Delegation, Decentralization - Formal and Informal Organization

UNIT III OPERATIONS MANAGEMENT: Principles and Types of Plant Layout - Methods of production (Job, batch and Mass Production), Work Study - Basic procedure involved in Method Study and Work Measurement

UNIT IV MATERIALS MANAGEMENT: Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records, Marketing: Functions of Marketing, Marketing Mix, Product Life Cycle and Channels of Distribution.

UNIT V HUMAN RESOURCES MANAGEMENT (HRM): Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Wage and Salary Administration, Job Evaluation and Merit Rating, Performance Appraisal

Text Books:

1. Aryasri, Management Science, TMH, 4 th Edition, 2009.

2. Stoner, Freeman, Gilbert, Management, Pearson Education, New Delhi, 6 th Edition,2004.

3. PannerSelvem, Production and Operations Management, Prentice Hall of India, 3 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 Publishing House,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)
IV B.TECH I SEMESTER Common to CSE,IT CSE(DS), CSE(AI & ML)

L	T	P	C
3	-	-	3

20AIT20 **SOFTWARE TESTING**
(Professional Elective Course-III)

COURSE OUTCOMES

1. Design test cases suitable for a software development for different domains.
2. Identify suitable tests to be carried out.
3. Prepare test planning based on the document.
4. Document test plans and test cases designed.
5. Use automatic testing tools and develop and validate a test plan.

UNIT-I INTRODUCTION

Testing as an Engineering Activity – Testing as a Process – Testing Maturity Model- Testing axioms – Basic definitions – Software Testing Principles – The Tester‘s Role in a Software Development Organization – Origins of Defects – Cost of defects – Defect Classes – The Defect Repository and Test Design –Defect Examples- Developer/Tester Support of Developing a Defect Repository.

UNIT - II TEST CASE DESIGN STRATEGIES

Test case Design Strategies – Using Black Box Approach to Test Case Design – Boundary Value Analysis – Equivalence Class Partitioning – State based testing – Cause-effect graphing – Compatibility testing – user documentation testing – domain testing - Random Testing – Requirements based testing – Using White Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing – Coverage and Control Flow Graphs – Covering Code Logic – Paths – code complexity testing – Additional White box testing approaches- Evaluating Test Adequacy Criteria.

UNIT - III LEVELS OF TESTING

The need for Levels of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests – The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination System Testing – Acceptance testing – Performance testing – Regression Testing – Internationalization testing – Ad-hoc testing – Alpha, Beta Tests – Testing OO systems – Usability and Accessibility testing – Configuration testing –Compatibility testing – Testing the documentation – Website testing.

UNIT - IV TEST MANAGEMENT

People and organizational issues in testing – Organization structures for testing teams – testing services – Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process – Reporting Test Results – Introducing the test specialist – Skills

needed by a test specialist – Building a Testing Group- The Structure of Testing Group- .The Technical Training Program.

UNIT - V TEST AUTOMATION

Software test automation – skills needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation – Test metrics and measurements – project, progress and productivity metrics.

TEXT BOOKS

1. Srinivasan Desikan and Gopalaswamy Ramesh, ―Software Testing – Principles and Practices‖, Pearson Education, 2006.

2. Ron Patton, ―Software Testing‖, Second Edition, Sams Publishing, Pearson Education, 2007.

AU Library.com

REFERENCES

1. Ilene Burnstein, ―Practical Software Testing‖, Springer International Edition, 2003.

2. Edward Kit,‖ Software Testing in the Real World – Improving the Process‖, Pearson Education, 1995.

3. Boris Beizer,‖ Software Testing Techniques‖ – 2nd Edition, Van Nostrand Reinhold, New York, 1990.

4. Aditya P. Mathur, ―Foundations of Software Testing _ Fundamental Algorithms and Techniques‖, Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008.

Mapping:

	PO1	PO2	PO3	PO 4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	3								3	1
CO2	2	3	3	-	2								2	
CO3	2	3	3	-	3								2	
CO4	2	3	3	-	2								1	
CO5	3	3	-	2	3								3	
Average	2.4	2.8	3	2	2.6								2.75	1
Level of correlation	3	3	3	2	3								3	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

L	T	P	C
3	-	-	3

20ACS38 CRYPTO CURRENCIES AND BLOCKCHAIN TECHNOLOGIES
(Professional Elective -III)

Course Outcomes:

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

1. Define the Fundamental concepts of Crypto currencies and Block chain Technologies
2. Demonstrate the application of hashing and public key cryptography in protecting the block chain.
3. Explain the elements of trust in block chain: Verification Validation and consensus.
4. Interpret crypto currency Regulation and for Block chain Applications

UNIT- I **7 Hrs**

Introduction to Cryptography & Crypto currencies: Cryptographic Hash Functions - Hash Pointers and Data Structures - Digital Signatures - Public Keys as Identities - A Simple Crypto currency - How Bitcoin Achieves Decentralization - Centralization vs. Decentralization - Distributed consensus - Consensus without identity using a block chain

UNIT- II **8 Hrs**

Mechanics of Bitcoin: Bitcoin transactions - Bitcoin Scripts - Applications of Bitcoin scripts - Bitcoin blocks - The Bitcoin network - Limitations and improvements

How to Store and Use Bitcoins - Hot and Cold Storage - Splitting and Sharing Keys - Online Wallets and Exchanges - Payment Services - Transaction Fees - Currency Exchange Markets

UNIT- III **10 Hrs**

Bitcoin Mining: The task of Bitcoin miners - Mining Hardware- Energy consumption and ecology - Mining pools - Mining incentives and strategies

Bitcoin and Anonymity: Anonymity Basics - How to De-anonymize Bitcoin – Mixing - Decentralized Mixing - Zerocoin and Zerocash

UNIT- IV **10Hrs**

Community, Politics, and Regulation: Consensus in Bitcoin - Bitcoin Core Software - Roots of Bitcoin - Governments Notice Bitcoin - Anti Money- Laundering - Regulation

UNIT- V **10Hrs**

Bitcoin as a Platform: Bitcoin as an Append- Only Log - Bitcoins as "Smart Property" - Secure Multi- Party Lotteries in Bitcoin - Bitcoin as Public Randomness Source - Prediction Markets and Real World Data Feeds

Altcoins and the crypto currency Ecosystem: Altcoins: A Few Altcoins in Detail - Relationship Between Bitcoin and Altcoins - Merge Mining

Text Book

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19, 2016).

Reference Books

1. Wattenhofer, The Science of the Blockchain
2. Antonopoulos, Mastering Bitcoin: Unlocking Digital Cryptocurrencies
3. Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System
4. DR. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger,"Yellow paper.2014.
5. Nicola Atzei, Massimo Bartoletti, and Tiziana Cimoli, A survey of attacks on Ethereum smart contracts

Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**											**2**	
CO2	**3**	**3**	**1**										**1**	
CO3	**3**	**3**	**2**	**2**									**3**	
CO4	**3**	**2**	**2**	**1**									**2**	1
Average	**3**	**2.5**	**1.66**	**1.5**									**2**	**1**
Level of Correlation	**3**	**3**	**2**	**2**									**2**	**1**

3-High Mapping **2- Medium Mapping** **3-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)

L	T	P	C
3	0	0	3

20ACS39 **CLOUD COMPUTING**
(Professional Elective Course-III)

Course outcome

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, Distributed system, 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
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**

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech I SEMESTER CSE(DS)
IV B.TECH I SEMESTER CSE

L	T	P	C
3	-	-	3

20ACD01 **FOUNDATION OF DATA SCIENCE**
(Professional Elective Course-III)

Course Outcome:

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

1. Apply various analytics techniques in a high dimensional data
2. Understand and apply dimensionality reduction techniques and its application.
3. Apply the link analysis techniques to perform social media analysis.
4. Develop machine learning models to explore hidden knowledge from the historica ldata.

UNIT I **9** Hrs

Introduction: High-Dimensional Space: The Law of Large Numbers, the Geometry of High Dimensions, Properties of the Unit Ball, Generating Points Uniformly at Randomfrom a Ball, Gaussians in High Dimension.

UNIT II **9** Hrs

SVD: Singular Vectors, Singular Value Decomposition (SVD), Best Rank-k Approximation, Left Singular Vectors, Power Method for Singular Value Decomposition, Singular Vectors and Eigenvectors, Applications of Singular Value Decomposition.

UNIT III **9** Hrs

Random Walks: Stationary Distribution, Markov Chain Monte Carlo, Areas and Volumes, Convergence of Random Walks on Undirected Graphs, Electrical Networks and Random Walks.

UNIT IV **9** Hrs

Machine Learning: Introduction, The Perceptron algorithm, Kernel Functions, Generalizing to New Data, Overfitting and Uniform Convergence, Support-Vector Machines, Deep Learning, Further Current Directions.

UNIT V **9** Hrs

Massive Data Problems: Frequency Moments of Data Streams, Matrix Algorithms using Sampling, Clustering: Introduction, k-Means Clustering, k-Center Clustering, Finding Low-Error clustering, Spectral Clustering.

TEXT BOOKS:

1. Foundations of Data Science, Avrim Blum, John Hopcroft, and Ravindran Kannan,2018 edition. (free online).

REFERENCE BOOKS:

1.Doing Data Science, Straight Talk From The Frontline, Cathy O'Neil and RachelSchutt, O'Reilly (2014).

2.Data Mining: Concepts and Techniques", Third Edition, Jiawei Han, Micheline Kamber and Jian Pei, ISBN 0123814790,(2011).

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**2**										**3**	**1**
CO2	**3**	**2**	**2**										**3**	**2**
CO3	**3**	**-**	**2**										**3**	**1**
CO4	**3**	**2**	**3**										**3**	**2**
Average	**3**	**2.33**	**2**										**3**	**1.5**
Level of correlation	**3**	**2**	**2**										**3**	**2**

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester CSE

L	T	P	C
3	-	0	3

20ACS40 MULTIMEDIA AND COMPRESSION TECHNIQUES
(Professional Elective Course-III)

Course Outcome

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

1. Ability to learn the basics of multimedia technologies and protocols.
2. Analyze, design and develop animation movies involving computer graphics and video analytics using advanced techniques and tools.
3 Apply multimedia data compression in virtual reality video processing.
4. Understand multimedia Video compression for MPEG and Audio compression processing.
5. To innovate ideas and smart solutions for Network communication, sound engineering and production of short films

UNIT - I **8 hrs**

Fundamental concepts in Text and Image: Multimedia and hypermedia, world wide web, overview of multimedia software tools. Graphics and image data representation-Graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

UNIT - II **6 hrs**

Fundamental concepts in video and digital audio: Types of video signals, analog video, digitalvideo, digitization of sound, MIDI, quantization and transmission of audio.

UNIT – III **10 hrs**

Multimedia Data compression : Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

UNIT – IV **7 hrs**

Multimedia Video Compression: Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.

UNIT – V **8 hrs**

Multimedia Networks: Local Area Network and Access Control-Internet Technologies and protocols-Protocol for multimedia Transmission and Interaction-Broadcasting/Multicast video on demand-Multimedia over Wireless Channels-Mobility Management.

TEXT BOOKS:

1. Fudamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI/Pearson Education.

2. Essentials ActionScript 2.0, Colin Moock, SPD O,REILLY.

REFERENCES :

1. Digital Multimedia, Nigel chapman and jenny chapman, Wiley-Dreamtech

2. Macromedia Flash MX Professional 2004 Unleashed, Pearson.

3. Multimedia and communications Technology, Steve Heath, Elsevier (Focal Press).

4. Multimedia Applications, Steinmetz, Nahrstedt, Springer.

5. Multimedia Basics by Weixel Thomson

6. Multimedia Technology and Applications, David Hilman , Galgotia

Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2											3	
CO2	3	3	3	2									3	1
CO3	3	2	2	1									3	1
CO4	3												2	
CO5	3	3	3	3	2			1					3	1
Average	3	2.5	2.66	2	2			1					2.8	1
Level of Correlation	3	3	3	2	2			1					3	1

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(DS),CSE(AI &ML)

L	T	P	C
3	-	0	3

20AIT24 SOFTWARE QUALITY ASSURANCE AND TESTING
(Professional Elective Course-IV)

COURSE OUTCOMES:

Upon completion of this course, the students should be able to

1. Perform functional and non-functional tests in the life cycle of the software product.
2. Understand system testing and test execution process.
3. Identify defect prevention techniques and software quality assurance metrics.
4. Apply techniques of quality assurance for typical applications.

UNIT I SOFTWARE TESTING - CONCEPTS, ISSUES, AND TECHNIQUES 8 hrs

Quality Revolution, Verification and Validation, Failure, Error, Fault, and Defect, Objectives of Testing, Testing Activities, Test Case Selection White-Box and Black ,test Planning and design, Test Tools and Automation, . Power of Test. Test Team Organization and management-Test Groups, Software Quality Assurance Group, System Test Team Hierarchy, and Team Building.

UNIT – II SYSTEM TESTING 10 hrs

System Testing - System Integration Techniques-Incremental, Top Down Bottom Up Sandwich and Big Bang, Software and Hardware Integration, Hardware Design Verification Tests, Hardware and Software Compatibility Matrix Test Plan for System Integration. Built- in Testing. Functional testing - Testing a Function in Context. Boundary Value Analysis, Decision Tables. acceptance testing - Selection of Acceptance Criteria, Acceptance Test Plan, Test Execution Test. software reliability - Fault and Failure, Factors Influencing Software, Reliability Models

UNIT III SYSTEM TEST CATEGORIES 10 hrs

System test categories Taxonomy of System Tests, Interface Tests Functionality Tests. GUI Tests, Security Tests Feature Tests, Robustness Tests, Boundary Value Tests Power Cycling Tests Interoperability Tests, Scalability Tests, Stress Tests, Load and Stability Tests, Reliability Tests, Regression Tests, Regulatory Tests.

Test Generation from FSM models- State-Oriented Model. Finite-State Machine Transition Tour Method, Testing with State Verification. Test Architectures-Local, distributed, Coordinated, Remote. system test design- Test Design Factors Requirement Identification, modeling a Test

Design Process Test Design Preparedness, Metrics, Test Case Design Effectiveness. system test execution- Modelling Defects, Metrics for Monitoring Test Execution .Defect Reports, Defect Causal Analysis, Beta testing, measuring Test Effectiveness.

UNIT IV SOFTWARE QUALITY 6 hrs

Software quality - People‘s Quality Expectations, Frameworks and ISO-9126, McCall‘s Quality Factors and Criteria – Relationship. Quality Metrics. Quality Characteristics ISO 9000:2000 Software Quality Standard. Maturity models- Test Process Improvement, Testing Maturity Model.

UNIT V SOFTWARE QUALITY ASSURANCE 7 hrs

Quality Assurance - Root Cause Analysis, modelling, technologies, standards and methodologies for defect prevention. Fault Tolerance and Failure Containment - Safety Assurance and Damage Control, Hazard analysis using fault-trees and event-trees. Comparing Quality Assurance Techniques and Activities.QA Monitoring and Measurement, Risk Identification for Quantifiable Quality Improvement. Case Study: FSM-Based Testing of Web-Based Applications.

TEXT BOOKS

1. Software Testing And Quality Assurance-Theory and Practice, KshirasagarNakPriyadarshiTripathy, John Wiley & Sons Inc,2008

REFERENCES:

1. Software Quality Engineering: Testing, Quality Assurance, and Quantifiable Improvement, Jeff Tian, John Wiley & Sons, Inc., Hoboken, New Jersey. 2005.
2. Software Quality Assurance - From Theory to Implementation, Daniel Galin, Pearson Education Ltd UK, 2004
3. Software Quality Assurance, MilindLimaye, TMH ,New Delhi, 2011

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	3	2	3	2								3	2
C02	3	1	2	2	1								3	1
C03	2	2	2	3	1								3	2
C04	2	2	1	3	1								3	2
Average	2.5	2	1.8	2.8	1.3								3	1.75
Level of Correlation	3	2	2	3	2								3	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech I Semester CSE

L	T	P	C
3	-	-	3

20ACS41 ADVANCED COMPUTER NETWORKS

(Professional Elective-IV)

Outcomes:

After completing this course the student will be able to:

1. Implement wireless devices in wireless network.
2. Analyze packet queueing theorem and delay analysis.
3. Select and implement best routing protocols for given network.
4. Implement routing protocols in Moble ad-hoc network.
5. Analyze energy efficiency and routing protocols in Wireless sensor network.

UNIT I **10 hours**

Wireless Networks and Mobile IP: Infrastructure of Wireless Networks, wireless LAN Technologies, IEEE 802.11 Standards, Cellular Networks, Mobile IP, Wireless Mesh Networks (WMNs), Intradomain routing protocols, Interdomain routing protocol.

UNIT II **10 hours**

Mobile transport protocol, TCP Congestion Control, Remote login protocol, File transport protocol.

Packet queues and delay Analysis: Little's theorem**,** Birth-and death process, queueing disciplines, Markovian FIFO Queueing System, Non Markovian and self-similar model, Networks of queues.

UNIT III **8 hours**

Multicasting Techniques and protocol: Basic Definition and techniques**,** Intradomain multicast protocols, Interdomain multicast protocols, Node Level multicast Algorithm.

UNIT IV **8 hours**

Virtual Private Networks (VPNs), Multiprotocol Label Switching (MPLS), overlay networks.

Mobile Ad-hoc Network: overview of Wireless Ad-Hoc Networks, Routing in ad-hoc networks, routing protocols in ad-hoc networks, Security of Ad-hoc Networks.

UNIT V 9 hours

Overview of IP telephony, VoIP signalling protocol, Real-Time Media Transport Protocol,

Wireless Sensor Networks: Sensor Network and protocol structures, Communication Energy model, clustering protocols, routing protocols,

TEXT BOOKS:

"Computer and Communication Networks", Nader F. Mir, Pearson Education,13th impression 2016

REFERENCE BOOKS:

1."Computer Networking: A Top-Down Approach Featuring the Internet", 7th Edition, James F. Kurose, Keith W.Ross, Pearson Education, 2017

2."Computer Network –A System approach" ,Fourth Edition, Larry L Peterson & Bruce S Davie ,Elsevier ,2007

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	2											3	1
C02	3	2	1										3	1
C03	3	2											3	1
C04	3	2											3	2
C05	3	2											3	1
Average	3	2	1										3	1.2
Level of Correlation	3	2	1										3	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester CSE

L	T	P	C
3	-	0	3

20ACS42 **PARALLEL COMPUTING**
(Professional Elective Course-IV)

Course Outcomes:

1. Understand the concepts of foundation of parallel computing.
2. Implement multiprocessor programming concepts in parallel computing.
3. Design parallel programming concept using MPI for distributed memory
4. Simulate parallel graphics processing using OpenCL.
5. Design parallel computation processing using OpenMPI

UNIT I **Foundations** **9hrs**

Why do we need parallel programming, Why - every computer is a parallel computer, How - there are three prevailing types of parallelism , What - time consuming computations can be sped up ,Overview of parallel systems, History of parallel computing, systems and programming, Modeling parallel computation, Multiprocessor models, The impact of communication, Parallel computational complexity, Laws and theorems of parallel computation.

UNIT II **Programming** **9hrs**

Programming multi-core and shared memory multiprocessors using OpenMP, Shared memory programming model, Using OpenMP to write multithreaded programs, Parallelization of loops, Parallel tasks

UNIT III **MPI processes and messaging** **9hrs**

Distributed memory computers can execute in parallel, Programmer's view, Message passing interface, Basic MPI operations, Process-to-process communication, Collective MPI communication, Communication and computation overlap

UNIT IV **OpenCL for massively parallel graphic processors** **9hrs**

Anatomy of a GPU , Introduction to GPU evolution, A modern GPU, Scheduling threads on compute units, Memory hierarchy on GPU, Programmer's view, OpenCL, Heterogeneous system, Execution model, Memory model, Programming in OpenCL, A simple example: vector addition, Sum of arbitrary long vectors, Dot product in OpenCL, Dot product in OpenCL using local memory, Naive matrix multiplication in OpenCL, Tiled matrix multiplication in OpenCL

UNIT V **Parallel Computation** **9hrs**

Parallel computation of the number pi, OpenMP, MPI, OpenCL, Parallel solution of 1-D heat equation, OpenMP, MPI, Parallel implementation of Seam Carving, Energy calculation, Seam identification, Seam labeling and removal, Seam carving on GPU

TEXT BOOK

Introduction to Parallel Computing: From Algorithms to Programming on State-of-the-Art Platforms, Roman Trobec, Boštjan Slivnik, Patricio Buli´c, Borut Robi˘c

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**											**3**	**2**
CO2	**3**	**2**		**1**									**3**	**2**
CO3	**3**	**2**	**2**										**3**	**2**
CO4	**3**	**2**			**2**								**3**	**2**
CO5	**3**	**2**			**2**								**3**	**2**
Average	**3**	**2**	**2**	**1**	**2**								**3**	**2**
Level of Correlation	**3**	**2**	**2**	**1**	**2**								**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(DS)
IV B.Tech I Semester CSE(PE-IV)
III B.Tech II Semester IT (Honors degree, Pool-III)

L	T	P	C
3	-	0	3

20ACD12 DATA VISUALIZATION TECHNIQUES
(Professional Elective Course-IV)

COURSE OUTCOMES:

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

1. Explain the representation of complex and voluminous data.
2. Identify and use various methodologies present in data visualization.
3. Apply various process and tools used for data visualization.
4. Analyze the process involved and security issues present in data visualization.

UNIT I INTRODUCTION 9 hrs

Context of data visualization – Definition, Methodology, Visualization design objectives. Key Factors – Purpose, visualization function and tone, visualization design options – Data representation, Data Presentation, Seven stages of data visualization, widgets, data visualization tools.

UNIT II VISUALIZING DATA METHODS 9 hrs

Mapping - Time series - Connections and correlations – Indicator-Area chart-Pivot table- Scatter charts, Scatter maps - Tree maps, Space filling and non-space filling methods-Hierarchies and Recursion - Networks and Graphs-Displaying Arbitrary Graphs-node link graph-Matrix representation for graphs- Info graphics

UNIT III VISUALIZING DATA PROCESS 10 hrs

Acquiring data, - Where to Find Data, Tools for Acquiring Data from the Internet, Locating Files for Use with Processing, Loading Text Data, Dealing with Files and Folders, Listing Files in a Folder, Asynchronous Image Downloads, Advanced Web Techniques, Using a Database, Dealing with a Large Number of Files. Parsing data - Levels of Effort, Tools for Gathering Clues, Text Is Best, Text Markup Languages, Regular Expressions (regexps), Grammars and BNF Notation, Compressed Data, Vectors and Geometry, Binary Data Formats, Advanced Detective Work.

UNIT IV INTERACTIVE DATA VISUALIZATION 8 hrs

Drawing with data – Scales – Axes – Updates, Transition and Motion – Interactivity - Layouts – Geomapping – Exporting, Framework – T3, .js, tablo.

UNIT V SECURITY DATA VISUALIZATION 9 hrs

Port scan visualization - Vulnerability assessment and exploitation - Firewall log visualization - Intrusion detection log visualization -Attacking and defending visualization systems – Creating security visualization system.

TOTAL=45Hrs

TEXT BOOKS:

1. Scott Murray, "Interactive data visualization for the web", O'Reilly Media, Inc., 2013.
2. Ben Fry, "visualizing Data", O' Reilly Media, Inc, 2007.
3. Greg Conti, "Security Data Visualization: Graphical Techniques for Network Analysis", NoStarch Press Inc, 2007.

Mapping:

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

L	T	P	C
3	-	0	3

20ACS43 Big Data Analytics(Professional Elective course –IV)

Course Outcomes:

The students should be able to:

1. Understand and Illustrate characteristics of big data and big data challenges in different domains including social media, transportation, finance and medicine.
2. Apply Hadoop framework to solve big data problem
3. Apply MapReduce, PIG scripts, HiveQL queries and HBase concepts to handle big data problems
4. Understand stream processing into real time big data applications

UNIT-I: Introduction to Big Data: (6 Hrs)

Introduction to Big Data, Definition of analytics, Characteristics of Big Data – Analytics flow for big data – Big data stack, Architectural components and design styles, Load levelling with queues, Load balancing with multiple consumers, CAP, Bloom Filter, Lambda Architecture, Scheduler, Pipes & Filters.

Unit II: Hadoop Framework: (9 Hrs)

Hadoop distributed File system: The design of HDFS, HDFS concepts, The Command Line Interface, Hadoop File systems, The Java Interface, Data flow, parallel copying with distcp, Hadoop archives.

Unit III Frameworks and Applications: (9 Hrs)

Introduction to MapReduce Framework, Anatomy of a MapReduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution. MapReduce Types and Formats: MapReduce Types, Input Formats, Output Formats. MapReduce Features: Counters, Sorting, Joins. Case study on WordCount program, Matrix Multiplication with MapReduce

Unit IV: Data Analytic Tools: (10 Hrs)

Pig: Introduction to Pig, Pig Latin, Data processing operators. Hive: Hive installation, Running hive, Compare hive with traditional databases, HiveQL, Querying Data. HBase: Clients, Praxis. Zookeeper: The Zookeeper service, Sqoop: Introduction to Sqoop, Database Imports: A deeper look, Working with imported data.

UNIT V: Stream Processing: (8 Hrs)

Mining data streams: Introduction to Streams Concepts, Stream Data Model, Sampling Data in a Stream, Filtering Streams, Counting Distinct Elements in a Stream, Estimating Moments, Counting

Oneness in a Window, Decaying Window. Case Studies – Recommendation Systems - Stock Market Predictions.

Text Books:

1. Bart Baesens, "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications (WILEY Big Data Series)", John Wiley & Sons,2014.
2. Tom White, "Hadoop: The Definitive Guide", Third Edition, O'reilly Media, Fourth Edition,2015.
3. Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", CUP, 2012.

References:

1. Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley& sons,2012.
2. Paul Zikopoulos, DirkdeRoos, Krishnan Parasuraman, Thomas Deutsch, JamesGiles, David Corrigan, "Harness the Power of Big Data:The IBM Big Data Platform", Tata McGraw Hill Publications,2012.
3. ArshdeepBahga and Vijay Madisetti, "Big Data Science & Analytics: A Hands On Approach ", VPT,2016.
4. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGrawHill Publishing,2012.
5. https://file.techscience.com/uploads/attached/file/20210209/20210209005411_48715.pdf (Case study Reference)
6. https://lendap.wordpress.com/2015/02/16/matrix-multiplication-with-mapreduce/ (Case Study Reference)

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2										3	2
CO2	2	2	2	2	1								2	3
CO3	3	2	3	1	3								3	2
CO4	2	2	3	1	1								3	1
Average	2.5	2.25	2.5	1.33	1.66								2.75	2
Level of Correlation	3	2	3	1	2								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,IT)

L	T	P	C
3	-	0	3

20AIT26 **SOFTWARE ARCHITECTURE**
(Professional Elective course –V)

COURSE OUTCOMES:

Upon Completion of the course, the students will be able to

CO1: Explain influence of software architecture on business and technical activities

CO2: Identify key architectural structures

CO3: Use styles and views to specify architecture

CO4: Design document for a given architecture

UNIT I INTRODUCTION AND ARCHITECTURAL DRIVERS

Introduction – What is software architecture? – Standard Definitions – Architectural structures – Influence of software architecture on organization-both business and technical – Architecture Business Cycle- Introduction – Functional requirements – Technical constraints – Quality Attributes**.**

UNIT II QUALITY ATTRIBUTE WORKSHOP

Quality Attribute Workshop – Documenting Quality Attributes – Six part scenarios – Case studies.

UNIT IIIARCHITECTURAL VIEW

Introduction – Standard Definitions for views – Structures and views – Representing views-available notations – Standard views – 4+1 view of RUP, Siemens 4 views, SEI's perspectives and views – Case studies

UNIT IVARCHITECTURAL STYLES

Introduction – Data flow styles – Call-return styles – Shared Information styles – Event styles – Case studies for each style.

UNIT VDOCUMENTING THE ARCHITECTURE

Good practices – Documenting the Views using UML – Merits and Demerits of using visual languages – Need for formal languages – Architectural Description Languages – ACME – Case studies. Special topics: SOA and Web services – Cloud Computing – Adaptive structures

TEXT BOOKS

1. Len Bass, Paul Clements, and Rick Kazman, "Software Architectures Principles and Practices", 2nd Edition, Addison-Wesley, 2003.

2. Anthony J Lattanze, “Architecting Software Intensive System. A Practitioner’s Guide”, Auerbach Publications, 2010.

REFERENCE BOOKS :

1. Paul Clements, Felix Bachmann, Len Bass, David Garlan, James Ivers, Reed Little, Paulo Merson, Robert Nord, and Judith Stafford, “Documenting Software Architectures. Views and Beyond”, 2nd Edition, Addison-Wesley, 2010.
2. Paul Clements, Rick Kazman, and Mark Klein, “Evaluating software architectures: Methods and case studies. Addison-Wesley, 2001.
3. Rajkumar Buyya, James Broberg, and Andrzej Goscinski, “Cloud Computing. Principles and Paradigms”, John Wiley & Sons, 2011
4. Mark Hansen, “SOA Using Java Web Services”, Prentice Hall, 2007

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	1	1	2	3	2								2	2
C02	3	2	1	2	1								1	2
C03	2	2	2	3	1								3	3
C04	1	2	1	2	1								1	2
Average	1.8	1.8	1.5	2.5	1.3								1.75	2.25
Level of Correlation	2	2	2	3	2								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

L	T	P	C
3	-	-	3

20ACS44 **WIRELESS NETWORK TECHNOLOGIES**
(Professional Elective course –V)

Course Outcomes:

At the end of this course, students will be able to

1. Establish network by using wired and wireless devices.
2. Apply radio communication techniques in wireless communication.
3. Use wireless standard to implement in wireless LAN Network
4. Demonstrate wireless Local and Wide area networks and their specifications.
5. Analyze the wireless mesh network and implement wireless mesh routing protocols.

UNIT I **7 hrs**

Wireless Network Architecture:

The OSI Network Model, Network Layer Technologies, Data Link Layer Technologies, Physical Layer Technologies, Operating System Considerations

Wired Network Topologies – A Refresher, Wireless Network Topologies, Wireless LAN Devices, Wireless PAN Devices, Wireless MAN Devices.

UNIT II **8 hrs**

Wireless Communication:

Radio Communication Basics: The RF Spectrum, Spread Spectrum Transmission, Wireless Multiplexing and Multiple Access Techniques, Digital Modulation Technique, RF Signal Propagation and Reception, Ultra Wideband Radio, MIMO Radio ,Near Field Communications

Infrared Communication Basics: The Ir Spectrum, Infrared Propagation and Reception

UNIT III

Wireless LAN Standards: **9 hrs**

The 802.11 WLAN Standards, The 802.11 MAC Layer, 802.11 PHY Layer, 802.11 Enhancements, Other WLAN Standards.

Implementing Wireless LANs: Evaluating Wireless LAN Requirements, Planning and Designing the Wireless LAN,Pilot Testing ,Installation and Configuration, Operation and Support

UNIT IV **8 hrs**

Wireless PAN Implementation: Introduction, Bluetooth (IEEE 802.15.1), Wireless USB , Contents vii ZigBee (IEEE 802.15.4) ,IRDA,Near Field Communications

Implementing Wireless PANs: Wireless PAN Technology Choices,Pilot Testing ,Wireless PAN Security

UNIT V 8 hrs

Wireless MANs : 802.16 wireless MAN standards, Other wireless MAN standards, Metropolitan Area networks, Implementing Wireless MAN.

The Future of Wireless Networking Technology: Wireless Mesh Network Routing, Network Independent Roaming, Gigabit Wireless LANs, Cognitive Radio

TEXT BOOKS:

1. Wireless Networking Technology: From Principles to Successful Implementation -Steve Rackley 2007

REFERENCE:

1. Principles of Wireless Networks, K. Pahlavan and P. Krishnamurthy, Pearson Education, 2002.

2. Wireless Communication and Networks, W. Stallings, Pearson Education, 2002.

3. Mobile Communications, Jochen Schiller, Addison Wesley, 2003.

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	2	2										3	2
C02	3	3	2										3	1
C03	3	3	3										3	
C04	3	2	2	1									3	1
C05	3	3	3										3	
Average	3	2.6	2.4	1									3	1.33
Level of Correlation	3	3	3	1									3	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester -CSE

L	T	P	C
3	-	-	3

20ACS45 DISTRIBUTED COMPUTING

(Professional Elective -V)

Course Outcomes:

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

1. Use various phases in designing an application or system.
2. Design OO Application using design patterns and UML approach.
3. Build high quality system for different real world issues.
4. Use the popular technical approach for analyzing, designing an application, system, or business.

UNIT – I 12Hrs

Introduction: Relation to computer system components –Motivation –Relation to parallel systems – Message-passing systems versus shared memory systems –Primitives for distributed communication –Synchronous versus asynchronous executions –Design issues and challenges. A model of distributed computations: A distributed program –A model of distributed executions – Models of communication networks –Global state – Cuts –Past and future cones of an event –Models of process communications. Logical Time: A framework for a system of logicalclocks –Scalar time –Vector time – Physical clock synchronization: NTP.

UNIT II 8Hrs

MESSAGE ORDERING & SNAPSHOTS

Message ordering and group communication: Message ordering paradigms –Asynchronous execution with synchronous communication –Synchronous program order on an asynchronous system –Group communication – Causal order (CO) – Total order. Global state and snapshot recording algorithms: Introduction –System model and definitions –Snapshot algorithms for FIFO channels

UNIT III 10Hrs

DISTRIBUTED MUTEX & DEADLOCK

Distributed mutual exclusion algorithms: Introduction – Preliminaries – Lamport‘s algorithm –Ricart-Agrawala algorithm – Maekawa‘s algorithm – Suzuki–Kasami‘s broadcast algorithm. Deadlock detection in distributed systems: Introduction – System model – Preliminaries –Models of deadlocks – Knapp‘s classification –Algorithms for the single resource model, the AND model and the OR model.

UNIT IV **10Hrs**

RECOVERY & CONSENSUS

Check pointing and rollback recovery: Introduction – Background and definitions – Issues in failure recovery – Checkpoint-based recovery – Log-based rollback recovery – Coordinated check pointing algorithm – Algorithm for asynchronous check pointing and recovery. Consensus and agreement algorithms: Problem definition – Overview of results – Agreement in a failure –free system – Agreement in synchronous systems with failures.

UNIT V **6Hrs**

P2P & DISTRIBUTED SHARED MEMORY

Peer-to-peer computing and overlay graphs: Introduction – Data indexing and overlays – Chord – Content addressable networks – Tapestry. Distributed shared memory: Abstraction and advantages – Memory consistency models –Shared memory Mutual Exclusion.

Text Books:

1. Liu, M., A. Tanenbaum, and M. Van Steen. "Distributed Systems: Concepts & Design." (2012).

Reference Books:

1. Van Steen, Maarten, and Andrew S. Tanenbaum. *Distributed systems*. Leiden, The Netherlands: Maarten van Steen, 2017."

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	1	1	2	3	2								2	2
C02	3	2	1	2	1								1	2
C03	2	2	2	3	1								3	3
C04	1	2	1	2	1								1	2
Average	1.75	1.75	1.5	2.5	1.25								1.75	2.25
Level of Correlation	2	2	2	3	1								2	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester CSE(DS)
IV B.Tech I Semester CSE

L	T	P	C
3	-	-	3

20ACD07 DATA MODELLING TECHNIQUES
(Professional Elective –V)

COURSE OUTCOMES:

On completion of the course, student will be able to

1. Recognize the process of formulating business objectives, data processing for predictive models.
2. Compare and contrast the underlying predictive modelling techniques.
3. Relate appropriate predictive modelling approaches to identify particular cases.
4. Infer the uses of Support Vector Machines and clustering techniques.
5. Apply predictive modelling approaches using a suitable package using rapid miner tool.

UNIT-I DATA UNDERSTANDING & PREPARATION 8 Hrs

Identifying business objectives, translating business objectives to data mining goals, reading data from various sources – Database/ Excel/ Text/others, data visualization – tabular & graphic, distributions and summary statistics, field reordering, Reclassify data.

UNIT-II DATA TRANSFORMATIONS 10 Hrs

Data quality issues, Data Audit, anomalies, relationships among variables, Extent of Missing Data, Segmentation, Outlier detection, Variable transformations, Variable derivation, Variable selection, Automated Data Preparation, combining data files, data restructuring, Aggregation, Duplicates removal, Sampling cases, Data Caching, Partitioning data, Missing Value replacement.

UNIT-III MODELING TECHNIQUES – I 9 Hrs

Partitioning The Data - Training, Validation & Testing, Model selection, Model development techniques - Linear regression, Logistic regression, Discriminant analysis, Bayesian networks, Neural networks, Rule Induction.

UNIT-IV MODELING TECHNIQUES – II 8 Hrs

Support vector machines, Cox regression, Time series analysis, Decision trees, Clustering, Association Rules, Sequence Detection, Which Technique to use when.

UNIT-V MODEL EVALUATION & DEPLOYMENT 10 Hrs

Model Validation, Determining Model Accuracy, Rule Induction Using CHAID, Automating Models for Categorical Targets, Automating Models for Continuous Targets, Comparing and Combining Models, Evaluation Charts for Model Comparison, Using Propensity Scores, Meta-Level Modelling, Error Modelling, Deploying Model, Exporting Model Results, Assessing Model Performance, Updating A Model.

TOTAL=45Hrs.

TEXT BOOKS

1. Jose, Jeeva. Introduction to Machine Learning. Khanna Book Publishing Co., 2020.
2. Data Mining & Predictive Modeling, IBM, ICE Publications.

REFERENCE BOOKS

1. Monte F. Hancock, Jr. Practical Data Mining. 1st edition. Auerbach Publications, 2011.
2. Jain, V. K. Machine Learning. First edition. Khanna Book Publishing Company, 2019.

Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**2**										**3**	**3**
CO2	**3**	**2**	**2**										**3**	**2**
CO3	**3**	**2**	**2**										**2**	**1**
CO4	**3**	**2**	**2**										**2**	**2**
Average	**2**	**2**	**2**										**2.5**	**2**
Level of correlation	**2.8**	**2.2**	**2**										**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,IT, CSE(DS),CSE(AI &ML))

L	T	P	C
3	-	-	3

20ACS46 COMPUTER VISION

(Professional Elective –V)

Course Outcomes:

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

1. Review image processing techniques for computer vision.
2. Understand shape and region analysis.
3. Understand Hough Transform and its applications to detect lines, circles, ellipses.
4. Implement three-dimensional image analysis techniques.
5. Design some applications using computer vision algorithms.

UNIT I IMAGE PROCESSING FOUNDATIONS 8 Hrs

Introduction – The Nature of vision - From Automated Visual Inspection to Surveillance - Images and Imaging Operations – Image Processing Operation – Basic image filtering operations – Thresholding techniques.

UNIT II SHAPES AND REGIONS 11 Hrs

Edge detection techniques – Corner and interest point detection – Mathematical morphology - Texture - Binary shape analysis – connectedness in Binary Images – Object labeling and counting – Size filtering – Distance functions and their uses– skeletons and thinning –Other Measure for Shape recognition - boundary trackingprocedures– Boundary Pattern Analysis – Centroidal profiles – Problems With The Centroidal Profile Approach –Accuracy of Boundary Length Measures.

UNIT III HOUGH TRANSFORM 11 Hrs

Line detection – Application of Hough Transform (HT) for line detection – The foot-of-normal method – Longitudinal Line Localization - Final Line Fitting – Using RANSAC For Straight Line Detection– Ht based circular object detection– Location Of Laparoscopic Tools – Circle and Ellipse Detection – Hough-Based Schemes For Circular Object Detection - The Problem Of Accurate Center Location - Overcoming The Speed Problem – Ellipse Detection - Case study: Human iris Location – hole detection

UNIT IV 3D VISION AND MOTION 10 Hrs

3-D Vision— The Variety Of Methods – Projection Schemes For Three-Dimensional Vision – Shape from Shading – photometric stereo – The Assumption Of Surface Smoothness - shape from texture – Use Of Structured Lighting - Three-Dimensional Object Recognition Schemes - Horaud's Junction Orientation Technique - An Important Paradigm—Location Of Industrial Parts

UNIT V APPLICATIONS 9 Hrs

Application: Automated Visual Inspection – The Process of Inspection – The Types Of Object to Be Inspected – X-Ray Inspection – Surveillance – foreground and background separation – particle filters – Use of Color Histogram for Tracking – Implementation of Particle Filters – Chamfer Matching, Tracking, And Occlusion - Combining Views From Multiple Cameras - Applications To The Monitoring Of Traffic Flow - License Plate Location – Occlusion Classification For Tracking – Distinguishing Pedestrians By Their Gait – Human Gait Analysis - Model-Based Tracking Of Animals.

TOTAL: 49 PERIODS

TEXT BOOK

E. R. Davies, ―Computer & Machine Vision‖, Fourth Edition, Academic Press, 2012.

REFERENCES

1. D. L. Baggio et al., ―Mastering Open CV with Practical Computer Vision Projects‖, Packt Publishing, 2012.
2. Jan Erik Solem, ―Programming Computer Vision with Python: Tools and algorithmsfor analyzing images‖, O'Reilly Media, 2012.
3. Mark Nixon and Alberto S. Aquado, ―Feature Extraction & Image Processing for Computer Vision‖, Third Edition, Academic Press, 2012.
4. R. Szeliski, ― Computer Vision: Algorithms and Applications‖, Springer 2011.
5. J. D. Prince, ― Computer Vision: Models, Learning, and Inference‖, Cambridge University Press, 2012.

MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3												3	2
CO2	2												2	2
CO3	2												1	3
CO4	2	2	3	2										2
C05	1	2	3	2									2	1
Average	2	2	3	2									2	2
Degree of Corrlatio	2	2	3	2									2	2

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

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))

L	T	P	C
3	-	-	3

20AEC56 EMBEDDED SYSTEMS
(Open Elective -III)

Course Outcomes:

After successful 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 single purpose processor design (RT-level), optimizing custom single purpose processors. General Purpose Processors - Basic architecture, operation- Pipelining, Programmer's view, development environment, Application Specific Instruction-Set Processors (ASIPs) – Micro Controllers and Digital Signal Processors.

UNIT III STATE MACHINE AND CONCURRENT PROCESS MODELS:

Introduction, models Vs. languages, finite state machines with data path model (FSMD), using 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/Software Introduction", 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))

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 motives business and institutional buyers.

UNIT-II:

Organizational Buying: BUYGRID MODEL, phases in purchasing decision process & their marketing implications, Buying centers, value analysis & vendor analysis.

UNIT-III

Industrial market segmentation, bases for segmenting industrial market-macro and micro variables. Targeting the industrial product, positioning the industrial product. Industrialproduct life cycle, product mix, Service component the provision of parts, technicalassistance, terms of sales.

UNIT – IV

The distribution channel component—Industrial distributors, Formulation of channel strategy-conditions influencing channel structure. Brief introduction to Marketing Logistics. The price component-conditions affecting price competition, cost factor, the nature of demand, pricing policies..

UNIT –V

The promotional component, advertising functions-establishing recognition, supporting and motivating salesmen and distributors measurement of advertising effectiveness. Personal selling-Personnel profiles selection and training, supervisions compensation sales promotion and public relations-Trade shows and exhibits, promotional novelties.

TEXT BOOKS:

1. Havaldar, K. K. (2005). Industrial Marketing: Text and Cases. India: Tata McGraw-Hill.
2. Phadtare, M. T. (2014). Industrial Marketing. India: PHI Learning.
3. Govindarajan, M. (2009). Industrial Marketing Management. India: Vikas Publishing House Pvt Limited.

REFERENCES:

1. Stacey, N., Wilson, A. (2014). Industrial Marketing Research (RLE Marketing): Management and Technique. United Kingdom: Routledge.
2. Chisnall, P. M. (1985). Strategic Industrial Marketing. United Kingdom: Prentice-Hall.
3. Brierty, E. G., Reeder, B. H., Reeder, R. R. (1991). Industrial Marketing: Analysis, Planning, and Control. United Kingdom: Prentice-Hall International.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1											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, CSD,CSM,IT)-(OE-III)
IV B.Tech I Semester EEE(OE-IV)

L	T	P	C
3	-	-	3

20AME54

Optimization Techniques
(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 Hours

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 Hours

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 Hours

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 Hours

Multistage optimization – dynamic programming; stochastic programming; Multi objective optimization, Genetic algorithms and Simulated Annealing technique.

UNIT: V Static and Dynamic Applications 10 Hours

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.

Textbook(s)

1. Kalyanmoy Deb, “Optimization for Engineering Design: Algorithms and Examples”, PHI Learning Private Limited, 2nd Edition, 2012.
2 Rao Singiresu S., “Engineering Optimization – Theory and Practice”, New Age International Limited, New Delhi, 3rd Edition, 2013.
3 Rajasekaran S and VijayalakshmiPai, G.A, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2011

Reference Books

1 Goldberg, David .E, “Genetic Algorithms in Search, Optimization and Machine Learning”, Pearson, 2009.
2 Srinivasan G, “Operations Research Principles and Applications”, PHI, 2017.

Mapping of COs with POs & PSOs

	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(AI & ML),CSE,IT)

L	T	P	C
3	-	-	3

20ACM26 MACHINE LEARNING TOOLS AND TECHNIQUES

(Job Oriented Elective -III)

COURSE OUTCOMES

On completion of the course, student will be able to

1. Describe the basics of Data mining process and machine learning models.
2. Use different knowledge representation techniques.
3. Apply different validation and selection models to improve the performance.
4. Analyze different machine learning tools for implementing real-world applications.

UNIT 1 INTRODUCTION 9Hrs.

Fielded Applications, The Data Mining Process, Machine Learning and Statistics, Generalization as Search, Data Mining and Ethics, Input: concepts, instances, attributes, Preparing the Input, output: Knowledge representation- Tables, Linear Models, Trees, Rules, Instance-Based Representation, Clusters.

UNIT 2 KNOWLEDGE REPRESENTATION 9Hrs.

Tables, Linear Models, Trees, Rules, Instance-Based Representation, Clusters, Algorithms: the basic methods, Inferring Rudimentary Rules, Simple Probabilistic Modeling, Divide-and-Conquer: Constructing Decision Trees, Covering Algorithms: Constructing Rules, Mining Association Rules, Linear Models, Instance-Based Learning, Clustering, Multi-Instance Learning.

UNIT 3 CREDIBILITY 9Hrs.

Training and Testing, Predicting Performance, Cross-Validation, Other Estimates, Hyperparameter Selection, Comparing Data Mining Schemes Predicting Probabilities, Counting the Cost, Evaluating Numeric Prediction, The Minimum Description Length Principle, Applying MDL to Clustering, using a Validation Set for Model Selection.

UNIT 4 TREES AND RULES 9Hrs.

Decision Trees, Classification Rules, Association Rules, extending instance-based and linear models- Instance-Based Learning, Extending Linear Models, Numeric Prediction with Local Linear

Models, WEKA Implementations. Data transformations- Attribute Selection, Discretizing Numeric Attributes, Projections, Sampling, Cleansing, Transforming Multiple Classes to Binary Ones, Calibrating Class Probabilities.

UNIT 5 MACHINE LEARNING TOOLS 9Hrs.

Knime, Accord. net, Scikit-Learn, TensorFlow, Pytorch, RapidMiner, Google Cloud AutoML, Jupyter Notebook, Apache Mahout, Azure Machine Learning studio, MLLIB, Orange3, IBM Watson, Pylearn2

Max.45Hrs.

TEXT/REFERENCEBOOKS

1. Datamining machine learning tools and techniques, Chris Pal, Ian Witten, Eibe Frank, Mark Hall, 2011.
2. Machine Learning the art of science and algorithms that make sense of data, peter, flach,2012.
3. Machine Learning for Absolute Beginners, Oliver Theobald,2021.
4. Interpretable Machine Learning, Christoph Molnar,2020.
5. Data Mining: Practical Machine Learning Tools and Techniques, Ian H. Witten, Eibe Frank, Mark A. Hall,2011.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	3	2	1									3	2
CO2	3	1	1									3	2
CO3	3	1	1									2	1
CO4	3	2	2									2	2
Average	3	1.5	1.25									2.5	1.75
Level of correlation	3	2	1									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)

L	T	P	C
3	-	0	3

20ACS47 NoSQL Databases
(Job Oriented Elective -III)

Course outcome:

1. Execute the application and Integration of NoSQL Databases
2. Explain performance tune of Key-Value Pair NoSQL databases.
3. Apply Nosql development tools on different types of NoSQL Databases
4. Develop basic applications using NoSQL

UNIT-I 9Hrs

NoSQL, The Value of Relational Databases, Getting at Persistent Data, Concurrency, Integration. Aggregate Data Models, Aggregates, Example of Relations and Aggregates, Consequences of Aggregate Orientation, Key-Value and Document Data Models, Column-Family Stores, Relationships, Graph Databases, Schemaless Databases, Materialized Views, Modeling for Data Access.

UNIT-II 8Hrs

Distribution Models: Single Server, Sharding, Master-Slave Replication, Peer-to-Peer Replication, Combining Sharding and Replication.

Consistency: Update Consistency, Read Consistency, Relaxing Consistency, The CAP Theorem, Relaxing Durability, Quorums.

UNIT-III 10Hrs

Map-Reduce, Basic Map-Reduce, Partitioning and Combining, Composing Map-Reduce Calculations, A Two Stage Map-Reduce Example, Incremental Map-Reduce

Document Database: Features, Consistency, Transactions, Availability, Query Features, Scaling, Suitable Use Cases, Event Logging, Content Management Systems, Blogging Platforms, Web

Analytics or Real-Time Analytics, E-Commerce Applications, When Not to Use, Complex Transactions Spanning Different Operations, Queries against Varying Aggregate Structure.

UNIT-IV 8Hrs

Introducing MongoDB, MongoDB Design Speed, Scalability, and Agility , Non-Relational Approach JSON-Based Document Store, Performance vs. Features, Running the Database AnywhereThe MongoDB Data Model :The Data Model, JSON and BSON, The Identifier, Capped Collection, Polymorphic Schemas, Object-Oriented Programming, Schema Evolution.

Using MongoDB Shell: Basic Querying, Create and Insert, Explicitly Creating Collections, Inserting Documents Using Loop, Inserting by Explicitly Specifying _id , Update, Delete, Read, Using Indexes, Stepping Beyond the Basics, Using Conditional Operators, Regular Expressions, Map Reduce, aggregate( ), Designing an Application's Data Model, Relational Data Modeling and Normalization, Mongo DB Document Data Model Approach.

UNIT-V 6Hrs

MongoDB Architecture Core Processes,Mongod, mongo, mongos MongoDB Tools, Standalone Deployment, Replication, Master/Slave Replication, Replica Set, Implementing Advanced Clustering with Replica Sets, Sharding, Sharding Components, Data Distribution Process, Data Balancing Process.

Text book:

Sadalage, P. & Fowler, NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence, Wiley Publications,1st Edition ,2019.

Reference Books:

Meier, Andreas, and Michael Kaufmann. SQL & NoSQL databases. Springer Fachmedien Wiesbaden, 2019.

CO-PO MAPPING:

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

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

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, CSM, CSD)

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 and Quantization - 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, Error Free 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, Region oriented 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
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))

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 contextof 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
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))

L	T	P	C
3	-	-	3

20AME20 **Total Quality Management & Reliability Engineering (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 hours**

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 hours**

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 hours**

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 hours**

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 hours

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.

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

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			

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester (Common to CSE, IT)

L	T	P	C
3	-	-	3

20ACS48 Virtual Reality

(Job Oriented Elective –IV)

Course Outcomes:

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

1. Describe how VR systems work and list the applications of VR.
2. Use the design and implementation of the hardware that enables VR systems to be built.
3. Describe the system of human vision and its implication on perception and rendering.
4. Explain the concepts of motion and tracking in VR systems

Unit I 9Hrs

Introduction: What is Virtual Reality – Modern VR Experience – Bird's –Eye View –Hardware – Software – Human Physiology and Perception

Unit II 9Hrs

The Geometry of Virtual Worlds: Geometric Models - Changing Position and Orientation - Axis-Angle Representations of Rotation -Viewing Transformations - Chaining the Transformations

The Physiology of Human Vision: From the Cornea to Photoreceptors – From Photoreceptors to the Visual Cortex - eye movements - implications for VR.

Unit III 8Hrs

Visual Perception: Perception of Depth- Perception of Motion,- Perception of Color- Combining Sources of Information

Visual Rendering: Ray Tracing and Shading Models – Rasterization - Correcting Optical Distortions - Improving Latency and Frame Rates – Immersive Photos and Videos

Unit IV 10Hrs

Motion in Real and Virtual Worlds: Velocities and Accelerations - The Vestibular System - Physics in the Virtual World - Mismatched Motion and Vection

Tracking: Tracking 2D Orientation – Tracking 3D Orientations- Tracking Position and Orientation - Tracking Attached Bodies – 3D Scanning of Environments

Unit V

Interaction: Motor Programs and Remapping – Locomotion – Manipulation - Social Interaction – Additional Interaction Mechanism

Evaluating VR Systems and Experience: Perception Training - Recommendations for Developers – Comfort and VR Sickness – Experiments on Human Subjects

Text Books:

1. Virtual Reality, Steven M. LaValle, Cambridge University Press, 2016

Reference Books:

1. Understanding Virtual Reality: Interface, Application and Design, William R Sherman and Alan B Craig, (The Morgan Kaufmann Series in Computer Graphics)". Morgan Kaufmann Publishers, San Francisco, CA, 2002

2. Developing Virtual Reality Applications: Foundations of Effective Design, Alan B Craig, William R Sherman and Jeffrey D Will, Morgan Kaufmann, 2009.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	1	1	2	3	2								2	2
C02	3	2	1	2	1								1	2
C03	2	2	2	3	1								3	3
C04	1	2	1	2	1								1	2
Average	1.75	1.75	1.5	2.5	1.5								1.75	2.25
Level of Correlation	2	2	2	3	2								2	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 CSE,CSE(AI & ML))

L	T	P	C
3	-	-	3

20ACS49 **DEVOPS (Job Oriented Elective -IV)**

Course Outcomes:

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

1. Articulate the main concepts of DevOps
2. Learn the key and enabling technologies of DevOps CI/CD Pipeline.
3. Learn some advances in DevOps
4. Design and Implement the Security in DevOps

UNIT I - Introduction 9 **hrs**

Getting Started with DevOps – Implementing CI/CD and Continuous Deployment – Understanding IaC Practices – What is DevOps? – Looking at DevOps Capabilities – Adapting DevOps – Looking at How Cloud Accelerates DevOps – Using DevOps to Solve New Challenges – Making DevOps Work

UNIT II - DevOps CI/CD Pipeline 9 hrs

Overviewing Git and its Command Lines – Understanding the Git Process and Git Flow Patterns – The CI/CD Principles – Using a Package Manager – Using Jenkins – Using Azure Pipeline – Using Git Lab CI.

UNIT III – Centralized Applications 9 hrs

Containerized Applications with Docker and Kubernetes – Installing Docker – Creating a Docker File – Building and Running a Container on a Local Machine – Pushing an Image to Docker Hub – Deploying a Container to ACI with CI/CD Pipeline.

UNIT IV – Containers 9 hrs

Example of Kubernetes Application Deployment – Using HELM as a package manager – Using AKS – Creating a CI/CD Pipeline for Kubernetes with Azure Pipelines – Testing APIs with Postman – Creating a Postman Collection with Requests – Using Environment and Variables to dynamize Request – Running the Newman Command Line.

UNIT V – Security in DevOps 9 hrs

Testing Azure Infrastructure Compliance with Chef InSpec – Using the Secure DevOps – Kit for Azure – Preserving data with HashiCrop's Vault – Reducing Deployment Downtime with Terraform

– Understanding Blue-Green Deployment Concepts and Patterns – Applying Blue – Green Deployment on Azure.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Mikael Krief, "Learning DevOps", Packt Brimingham - Mumbai, 2019.
2. Sanjeev Sharma, Bernie Coyne, “DevOps for Dummies”, 2nd IBM Edition, 2020

REFERENCE BOOKS:

1. Gene Kim, Jez Humble, Patrick Debois, John Willis, “The DevOps Handbook”, IT Revaluation Press, LLC, 2018

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2				1			1					1	2
CO2	2				2								1	2
CO3	2				1								1	3
CO4	2			1	2			1					1	2
Average	2			1	1.5			1					1	2.25
Level of Correlation	2			1	2			1					1	2

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

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))

	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 andProfessional 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

HONORS DEGREE

Sri Venkateswara College of Engineering and Technology
(Autonomous)
II B.Tech II Semester (Common to CSE, IT, CSE (AI & ML))

L	T	P	C
3	1	0	4

20ACS53 REAL TIME SYSTEMS

Course Outcomes:

At the end of the subject, students will be able to:

1. Understand the features of Real Time System
2. Implement the different processor scheduling and Task assignment
3. Understand the various real time protocols
4. Analyze the difference between traditional and real time database
5 Demonstrate the function of real time system function using tools

UNIT I 7 hrs

Introduction to real-time computing - Structure of a real-time system - Characterization of real-time systems and tasks - Performance measures

UNIT II 7 hrs

Task Assignment and Scheduling -Task Assignment and Scheduling - Uniprocessor scheduling algorithms - Task assignment - Mode changes - Fault tolerant scheduling.

UNIT III 8 hrs

Real Time Communication Real-time Communication - Network topologies and architecture issues - Protocols - Contention-based, token-based, polled bus - Fault tolerant routing.

UNIT IV 8 hrs

Real Time Databases Real-time Databases - Transaction priorities and aborts - Concurrency control issues - Scheduling algorithms - Two-phase approach to improve predictability.

UNIT V 7 hrs

Programming Languages and Tools Programming Languages and Tools - Hierarchical decomposition - Run-time error handling - Overloading - Timing specification - Recent trends and development

Text books:

1. C. M. Krishna and Kang G. Shin, "Real-Time Systems", International Edition, McGraw Hill Companies, Inc., New York, 1997

Reference books:

1. Rajib Mall, "Real-Time Systems: Theory and Practice", 1st edition, Pearson Education, 2012

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

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

HONORS DEGREE

Sri Venkateswara College of Engineering and Technology
(Autonomous)

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

L	T	P	C
3	1	0	4

20ACS54 SOFT COMPUTING AND NEURAL NETWORKS

Course Outcomes:

After completion of course, students would be able to:

1. *Apply various soft computing concepts for practical applications*
2. *Use fuzzy rules and reasoning to develop decision making and expert system*
3. *Choose and design suitable neural network for real time problems*
4. *Apply optimization techniques and genetic Algorithm*
5. *Review the various hybrid soft computing techniques and apply in real time problems*

UNIT I **7 hrs**

INTRODUCTION TO SOFT COMPUTING AND NEURALNETWORKS:

Evolution of Computing: Soft Computing Constituents, From Conventional AI to Computational Intelligence: Machine Learning Basics

UNIT II **8 hrs**

FUZZY LOGIC: Fuzzy Sets, Operations on Fuzzy Sets, Fuzzy Relations, Membership Functions: Fuzzy Rules and Fuzzy Reasoning, Fuzzy Inference Systems, Fuzzy Expert Systems, Fuzzy Decision Making.

UNIT III **9 hrs**

NEURAL NETWORKS: Machine Learning Using Neural Network, Adaptive Networks, Feed forward Networks, Supervised Learning Neural Networks, Radial Basis Function Networks : Reinforcement Learning, Unsupervised Learning Neural Networks, Adaptive Resonance architectures, Advances in Neural networks

UNIT IV **8 hrs**

GENETIC ALGORITHMS: Introduction to Genetic Algorithms (GA), Applications of GA in Machine Learning : Machine Learning Approach to Knowledge Acquisition.

UNIT V **9 hrs**

Matlab/Python Lib: Introduction to Matlab/Python, Arrays and array operations, Functions and Files, Study of neural network toolbox and fuzzy logic toolbox, Simple implementation of Artificial Neural Network and Fuzzy Logic

TEXT BOOK:

1.Abraham Silberschatz , Peter B. Galvin, Greg Gagne," *Operating System Concepts*," John Wiley and Sons**,** Eighth Edition, 2009.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		**3**		**2**					**1**				**1**	**2**
CO2	**2**	**3**		**2**					**2**					**2**
CO3	**2**	**2**	2										**1**	**3**
CO4		**3**					**2**						**3**	**2**
CO5		**3**					**3**						**2**	**2**
Average	**2**	**2.8**	**2**	**2**			**2.5**		**1.5**				**1.75**	**2.2**
Level of correlation	**2**	**3**	**2**	**2**			**3**		**2**				**2**	**2**

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

HONORS DEGREE

Sri Venkateswara College of Engineering and Technology
(Autonomous)
II B.Tech II Semester(Common to CSE,IT,CSE(AI & ML))

L	T	P	C
3	1	0	4

20ACS55 ADVANCED DATABASES

Course Outcomes:

At the end of the course, the students would be able to

1. Select the appropriate high performance database like parallel and distributed database
2. Represent the data using XML database for better interoperability
3. Represent the basics of new trends such as: XML in relational databases, spatial data, multimedia databases.
4. Design the process and optimize database transactions

UNIT I **8 hrs**

Object Based Databases: Overview - complex Data Types - Structured Types and Inheritance in SQL - Table Inheritance - Array and Multiset Types in SQL – Object-Identity and Reference Types in SQL - Implementing O-R features - Persistent Programming Languages - Object Relational Mapping - Object Oriented versus Object Relational.

UNIT II **9 hrs**

XML: Motivation - Structure of XML data - XML Document schema - Querying and Transformation - Application Program Interface to XML - Storage of XML data - XML applications.

UNIT III **8 hrs**

Query processing: Overview - Measures of Query Cost - Selection operating - sorting - Join operation - Other Operations - Evaluation of Expressions.

Query Optimization: Overview - Transformation of Relational Expressions - Estimating Statistics of Expressing Results - Choice of Evaluation plans - Materialized Views.

UNIT IV **9 hrs**

Parallel Databases: Introduction - I/O Parallelism - Interquery Parallelism – Interquery Parallelism- Interoperation Parallelism - Query Optimization - Design of Parallel Systems.

Distributed Databases: Homogenous and Heterogeneous Databases - Distributed data storage- Distributed Transactions - Commit Protocols - concurrency Control in Distributed Databases – Availability - Distributed Query Processing - Heterogeneous Distributed Databases - cloud Based Databases - Directory systems.

UNITV **8 hrs**

Advanced Application development: Performance Tuning - Performance Benchmarks - Other

Issues in Application Development – Standardization.

Spatial and Temporal Data and Mobility: Motivation- Time in Databases - spatial and Geographical Data - Multimedia Databases - Mobility and Personal databases.

TEXT BOOKS:

1. Abraham Silbershatz, Henry F Korth, S Sudharshan, "Database System Concepts", McGrawHill International Edition, Sixth Edition,2010.
2. R.Elmasri, S.B.Navathe, Somayajulu, Gupta, "Fundamentals of Database Systems", Pearson Education, Fourth Edition, 2006.

REFERENCE BOOKS:

1. C.J.Date, A.Kannan and S.Swamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education,2006.
2. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", McGraw Hill, Third Edition2004.
3. Thomas Cannolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education,2007.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**												**1**	**3**
CO2	**3**	**3**	**2**											**2**
CO3	**2**	**3**	**3**										**2**	**1**
CO4		**3**	**2**										**3**	**2**
Average	**2.66**	**3**	**2.33**										**2**	**2**
Level of correlation	**3**	**3**	**2**										**2**	**2**

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

HONORS DEGREE

Sri Venkateswara College of Engineering and Technology
(Autonomous)
II B.Tech II Semester (Common to CSE, IT, CSE (AI & ML))

L	P	T	C
3	1	0	4

20ACS56 NATURAL LANGUAGE PROCESSING

COURSE OUTCOMES:

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

1. Understand the principles and Process the Human Languages Such as English and other Indian Languages using computers.
2. Creating CORPUS linguistics based on digestive approach (Text Corpus method) Demonstrate understanding of state-of-the-art algorithms and techniques for text-based processing of natural language with respect to morphology.
3. Perform POS tagging for a given natural language. Select a suitable language modeling technique based on the structure of the language.
4. Apply the syntactic and semantic correctness of sentences using grammars and labelling.
5. Develop Computational Methods for Real World Applications and explore deep learning based NLP

UNIT I **7 hrs**

Introduction to various levels of natural language processing, Ambiguities and computational challenges in processing various natural languages. Introduction to Real life applications of NLP such as spell and grammar checkers, information extraction, question answering, and machine translation.

UNIT II **8 hrs**

Character Encoding, Word Segmentation, Sentence Segmentation, Introduction to Corpora, Corpora Analysis.

Inflectional and Derivation Morphology, Morphological Analysis and Generation using finite state transducers.

UNIT III **7 hrs**

Introduction to word types, POS Tagging, Maximum Entropy Models for POS tagging, Multi-word Expressions.The role of language models. Simple N-gram models. Estimating parameters and smoothing. Evaluating language models.

UNIT IV **7 hrs**

Introduction to phrases, clauses and sentence structure, Shallow Parsing and Chunking, Shallow Parsing with Conditional Random Fields (CRF), Lexical Semantics, Word Sense Disambiguation, WordNet, Thematic Roles, Semantic Role Labelling with CRFs.

UNIT V 8 hrs

NL Interfaces, Text Summarization, Sentiment Analysis, Machine Translation, Question answering.

Recent Trends in NLP

Text Books:

1.Daniel Jurafsky and James H. Martin "Speech and Language Processing", 3rd edition, Prentice Hall, 2009.

Reference Books:

1. Chris Manning and HinrichSchütze, "Foundations of Statistical Natural Language Processing", 2nd edition, MITPress Cambridge, MA, 2003.
2. NitinIndurkhya, Fred J. Damerau "Handbook of Natural Language Processing", Second Edition, CRC Press, 2010.
3. James Allen "Natural Language Understanding", Pearson Publication 8th Edition. 2012.

Mapping of COs to POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	P012	PS01	PSO 2
CO1													3	2
CO2					3						2		3	2
CO3							3						3	1
C04	3												3	2
C05							3						3	3
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)
III B.Tech I Semester ,CSE

L	T	P	C
3	1	-	4

20ACS57 **SENTIMENT ANALYSIS (Honors Degree)**

Course Outcomes:

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

1. Understand various sentiment concepts
2. Apply various sentiment classification methods.
3. Understand aspect-based sentiment analysis and entity extraction.
4. Identify fake sentiments in real time applications.

UNIT- I 9 Hrs

Introduction: Sentiment analysis applications, Sentiment Analysis Research. The problem of Sentiment Analysis: Definition of Opinion, Definition of Opinion summary, Affect, Emotion and Mood, Different types of Opinions.

UNIT-II 9 Hrs

Sentiment Classification: Document sentiment Classification: Supervised sentiment classification, Unsupervised sentiment classification, Sentiment Rating prediction, Cross-Domain sentiment classification, Cross-Language sentiment classification, Emotion classification of Documents. Sentence subjectivity and sentiment classification: Subjectivity, Sentence subjectivity classification, sentence sentiment classification, Dealing with conditional sentences.

UNIT-III 9 Hrs

Aspect sentiment classification & Entity Extraction: Aspect sentiment classification, Rules of sentiment comparison, Negation and sentiment. Frequency-based aspect extraction, exploiting syntactic relations, Using supervised learning, Mapping implicit aspects, Grouping aspects into categories, Exploiting topic models, Entity extraction and Resolution.

UNIT-IV 9 Hrs

Lexicon Generation & Analysis: Dictionary Based Approach, Corpus-based approach, Desirable and Undesirable facts. Analysis of Comparative opinion: Problem definition, Identify Comparative sentences, Identifying the preferred Entity set, Special types of comparison.

UNIT-V 9 Hrs

Detecting Fake Opinion: Detecting Fake or Deceptive opinions**:** Different types of span, Supervised fake review detection, Automated discovery of abnormal patterns, Model-based behavioral analysis, Group spam detection, Identifying Reviewers with multiple userids, Exploiting Business in reviews. Case study on Supervised Yelp data experiment.

TEXT BOOK:

2. Bing Liu, "Sentiment Analysis Mining Opinions, Sentiments, and Emotions " 2nd Edition, Cambridge publication, 2020

REFERENCE BOOKS:

1. Agarwal, Basant, Richi Nayak, Namita Mittal, and Srikanta Patnaik, eds. Deep learning-based approaches for sentiment analysis. Singapore: Springer, 2020..
2. Gerardus Blokdyk "Sentiment Analysis a Complete Guide", Edition, 2021

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	3	2	3									3	3
C02	3	2	2	3									3	3
C03	2	2	1	2									3	2
C04	3	1	1		3								3	3
Average	2.75	2	1.5	2.66	3								3	2.75
Level of correlation	3	2	2	3	3								3	3

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester ,CSE

L	T	P	C
3	1	-	4

20ACS58

Cyber Security Essentials

Course Outcomes:

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

1. Describe the basics and need for information security
2. Identify, analyze, and evaluate infrastructure and network vulnerabilities.
3. Analyze different access control and authentication methods.
4. Identify and assess current and anticipated security risks and vulnerabilities with vulnerability Assessment and auditing methods.

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UNIT-I 12HRS

Introduction to Security: Challenges of Securing Information, Definition of Information Security, Attackers, Attacks and Defenses. Systems Threats and Risks: Software-Based Attacks, Hardware-Based Attacks, Attacks on Virtualized Systems, Hardening the Operating System, Preventing Attacks that Target the Web Browser, Hardening Web Servers, Protecting Systems from Communications-Based Attacks, Applying Software Security Applications.

UNIT-II 12HRS

Network Vulnerabilities and Attacks: Network Vulnerabilities, Categories of Attacks, Methods of Network Attacks. Network Defenses: Crafting a Secure Network, Applying Network Security Devices, Host and Network Intrusion Prevention Systems (HIPS/NIPS), Protocol Analyzers, Internet Content Filters, Integrated Network Security Hardware.

UNIT-III 12HRS

Access Control: Access Control Models and Practices, Logical Access Control Methods, Physical Access Control. Authentication: Definition of Authentication, Authentication Credentials, Extended Authentication Protocols, Remote Authentication and Security.

UNIT-IV

12HRS

Vulnerability Assessment: Risk Management, Assessment, and Mitigation, Identifying Vulnerabilities. Security Audit: Privilege Auditing, Usage Auditing, Monitoring Methodologies and Tools.

UNIT-V 12HRS

Cryptography: Introduction to Cryptography, Cryptographic Algorithms, Using Cryptography on Files and Disks, Digital Certificates, Public Key Infrastructure, Key Management.

Text Book:

Security+ Guide to Network Security Fundamentals, Third Edition, Mark Ciampa, Cengage Learning.

Reference Book:

1. Principles of Information Security, Michael E. Whitman and Herbert J. Mattord, Cengage Learning.
2. Information Security: The Complete Reference, Rhodes-Ousley, Mark, Second Edition, McGraw-Hill.
3. Information Security: Principles and Practices, Mark S. Merkow, Jim Breithaupt, 2nd Edition, Pearson Education

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-								1	2
CO2	2	3	-	-	-								1	3
CO3	3	2	-	2	-								1	2
CO4	3	3	3	2	1								1	1
Average	2.75	2.5	3	2	1								1	2
Level of correlation	3	3	3	2	1								1	2

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester ,CSE

L	T	P	C
3	1	-	4

20ACS59 **SECURITY OF CYBER-PHYSICAL SYSTEMS**

Course Outcomes:

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

1. Articulate the main concept of Cyber Security
2. Learn security in operating system and networks
3. Analyze the defenses security countermeasures.
4. Learn the privacy in Cyber Space.
5. Analyze the core issues of management and incidents.

UNIT I – Introduction to Cyber Security 9hrs

What is Cyber Security – Threats – Harm – Vulnerabilities – Controls – Authentication – Access Control - Cryptography – Web User Side – Browser Attacks – Web Attacks Targeting Users – Obtaining User or Website Data – Email Attacks.

UNIT II - Security in Operating Systems & Networks 9hrs

Security in Operating Systems - Security in the Design of Operating Systems -Rootkit - Network security attack- Threats to Network Communications - Wireless Network Security - Denial of Service - Distributed Denial-of-Service.

UNIT III – Defenses Security Countermeasures 9hrs

Cryptography in Network Security - Firewalls - Intrusion Detection and Prevention Systems - Network Management - Databases - Security Requirements of Databases - Reliability and Integrity - Database Disclosure - Data Mining and Big Data.

UNIT IV – Privacy in Cyber Space 9hrs

Privacy Concepts -Privacy Principles and Policies -Authentication and Privacy - Data Mining - Privacy on the Web - Email Security - Privacy Impacts of Emerging Technologies – Cloud Computing Concepts – Moving to the Cloud – Cloud Security Tools and Techniques – Cloud Identity Management

UNIT V – Management and Incidents 9hrs

Security Planning - Business Continuity Planning - Handling Incidents - Risk Analysis - Dealing with Disaster - Emerging Technologies - The Internet of Things - Economics - Electronic Voting - Cyber Warfare.

TOTAL: 45 PERIODS

TEXT BOOKS:

Charles P. Pfleeger Shari Lawrence Pfleeger Jonathan Margulies, Security in Computing, 5th Edition , Pearson Education , 2015

REFERENCE BOOKS:

1. George K.Kostopoulous, Cyber Space and Cyber Security, CRC Press, 2013.

2. Martti Lehto, Pekka Neittaanmäki, Cyber Security: Analytics, Technology and Automation edited, Springer International Publishing Switzerland 2015.
3. Nelson Phillips and Enfinger Steuart, ―Computer Forensics and Investigations‖, Cengage Learning, New Delhi, 2009.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**2**												**1**	**2**
CO2	**2**												**2**	**3**
CO3	**3**	**2**	**1**	**2**	**1**								**1**	**2**
CO4	**3**			**1**									**1**	**2**
CO5	**3**	**2**	**3**	**2**	**2**								**3**	**2**
Average	**2.6**	**2**	**2**	**1.66**	**1.5**								**1.6**	**2.2**
Level of correlation	**3**	**2**	**2**	**2**	**1**								**2**	**3**

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester ,CSE

	L	T	P	C
	3	1	-	4

20ACS60 INTERNETWORKING WITH TCP/IP

Course Outcomes:

At the end of this course, students will be able to

1. Understand functionality of each layer in the TCP/IP protocol with examples.
2. Implement subnetting and supernetting for classful architecture and show how they were used to overcome the deficiency of classful addressing..
3. Use various routing protocols in autonomous systems.
4. Implement address resolution protocol (ARP) can be used in dynamically map a logical address to a physical address
5. Demonstrate dynamic host configuration protocol in the wired network.

UNIT I 10 hours

Introduction and Underlying Network Technologies, The OSI Model and the TCP/IP Protocol Suite : Protocol Layers , The OSI Model **,** TCP/IP Protocol Suite **,** Addressing,

Wired Local Area Networks : Wireless LANS, Connecting Devices

UNIT II 9 hours

Introduction To Network Layer : Switching, Packet Switching At Network Layer, Network Layer Services, Other Network Layer Issues, Ipv4 Addresses: Classful Addressing, Classless Addressing, Special Addresses

UNIT III 9 hours

Delivery and Forwarding of IP Packets: Delivery, Forwarding, Structure of a Router

Internet Protocol Version 4 (IPv4) : Datagrams, Fragmentation, Options, checksum, IP OVER ATM, Security, IP Package

UNIT IV 9 hours

Address Resolution Protocol (ARP): ADDRESS MAPPING, THE ARP PROTOCOL, ATMARP, ARP PACKAGE

Internet Control Message Protocol Version 4(ICMPv4): MESSAGES, DEBUGGING TOOLS, ICMP PACKAGE

Mobile IP : Address ,Agents , Three Phases, Inefficiency In Mobile IP,

UNIT V **10 hours**

Unicast Routing Protocols (RIP, OSPF, and BGP) : Introduction, Intra- And Inter-Domain Routing, Distance Vector Routing,RIP, Link State Routing, OSPF, Path Vector Routing, BGP

Host Configuration: DHCP : Introduction, DHCP Operation, Configuration, File Transfer: FTP and TFTP

Text Books

Behrouz A Forouzan, "TCP/IP Protocol Suite", TMH, 4th Edition,2010

References

1. Mahbub Hasan & Raj Jain, " High performance TCP/IP Networking", PHI -2005
2. Douglas. E.Comer, "Internetworking with TCP/IP ", Volume I PHI
3. Larry L. Perterson and Bruce S. Davie , "Computer Networks- A Systems Approach", 2011, Morgan Kaufmann
4. B.A. Forouzan, "Data communication & Networking", TMH, 4th Edition.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3												2	3
C02	2	1	1	1	2								3	2
C03	2	2	2	3									2	1
C04	2	2	2	1	1								3	2
C05	3												3	1
Average	2.4	1.66	1.66	1.6	1.5								2.6	1.8
Level of correlation	3	2	2	2	1								3	2

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester ,CSE

L	T	P	C
3	1	-	4

20ACS61 **REGRESSION MODELLING STRATEGIES**

COURSE OUTCOMES:

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

1. Acquire knowledge in Linear Regression and non-linear Regression Models
2. Familiar with modern methods for fitting multivariable regression models
3. Validate models for predictive accuracy and to detect Over fitting
4. Interpret fitted models using both parameter estimates and graphics
5. Critique the literature to detect models that is likely to be unreliable

UNITI INTRODUCTION 8 Hrs

Hypothesis Testing, Estimation and Prediction, Uses of Predictive Multivariable Modeling, Misunderstandings about Prediction vs. Classification, Planning for Modeling, Choice of the Model, Model uncertainty, Data-driven Model Specification, Notation for Multivariable Regression Models, Model Formulations, Interpreting Model Parameters, Relaxing Linearity Assumption for Continuous Predictors, Recursive Partitioning: Tree Based Models, Multiple Degree of Freedom Tests of Association, Assessment of Model Fit.

UNIT II MISSING DATA 10 Hrs

Types of Missing Data, Prelude to Modeling, Missing Values for Different Types of response variables, Problems with Simple Alternatives to Imputation, Strategies for Developing an Imputation Model, Single Conditional Mean Imputation, Predictive Mean Matching, Multiple Imputation, Diagnostics, Bayesian Methods for Missing Data.

UNIT III MULTIVARIABLE MODELLING STRATEGIES 9 Hrs

Pre-specification of Predictor Complexity Without Later Simplification, Checking Assumptions of Multiple Predictors Simultaneously, Variable Selection, over fitting and Limits on Number of Predictors, Shrinkage, Collinearity, Data Reduction, Comparing Two Models,

UNIT IV DESCRIBING, RESAMPLING, VALIDATING, AND SIMPLIFYING THE MODEL 9 Hrs

Describing the Fitted Model, The Bootstrap, Model Validation, Bootstrapping Ranks of Predictors, Simplifying the Final Model by approximating it, The R-Modeling Language, User-Contributed Functions, The rms Package, Other Functions.

UNIT V LOGISTIC REGRESSION 11 Hrs

Binary Logistic regression, Model, Estimation, Test Statistics, Residuals, Assessments of Model Fit, Collinearity, Overly Influential Observations, Quantifying Predictive Ability, Validating the Fitted Model, Describing the Fitted Model, Bayesian Logistic Model Example, Ordinal Logistic Regression, Background, Ordinality Assumption, Proportional Odds Model, Continuation Ratio Model.

TOTAL: 47 PERIODS

TEXTBOOK

1. Frank E HarrellJr,“ Regression Modeling Strategies”, Springer Publications, Second Edition, 2016.

REFERENCEBOOK

1. Douglas C.Montgomery, Elizabeth A.Peck, G.Geoffrey Vining, “Introduction to Linear Regression Analysis”, Wiley publication, Fifth Edition, 2012.

CO- PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**		**1**									**3**	**2**
CO2	**2**	**2**											**-**	**3**
CO3	**2**	**1**											**2**	**-**
CO4	**2**	**2**	**1**	**3**	**1**								**2**	**2**
CO5	**2**	**1**		**3**	**2**								**2**	**2**
Average	**2.2**	**1.6**	**1**	**2.33**	**1.5**								**2.25**	**2.25**
Level of correlation	**2**	**3**	1	**2**	**2**								**2**	**2**

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester ,CSE

L	T	P	C
3	1	-	4

20ACS62 **SECURE CODING**

Course Outcomes:

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

1. List secure systems and various security attacks
2. Demonstrate the development of process of software leads to secure coding practices
3. Apply Secure programs and various risk in the software's
4. Classify various errors that lead to vulnerabilities

UNIT–I 12HRS

Introduction-Need for secure systems, Proactive security development process, Security principles to live by and threat modeling.

UNIT–II 12HRS

Secure Coding in C-Character strings- String manipulation errors, String Vulnerabilities and exploits Mitigation strategies for strings, Pointers, Mitigation strategies in pointer based vulnerabilities Buffer Overflow based vulnerabilities

UNIT–III 12HRS

Secure Coding in C++ and Java-Dynamic memory management, Common errors in dynamic memory management, Memory managers, Double –free vulnerabilities, Integer security, Mitigation strategies

UNIT–IV 12HRS

Database and Web Specific Input Issues-Quoting the Input, use of stored procedures, Building SQL statements securely, XSS related attacks and remedies

UNIT–V 12HRS

Software Security Engineering-Requirements engineering for secure software: Misuse and abuse cases, SQUARE process model Software security practices and knowledge for architecture and design

Text Book:

1. Michael Howard, David LeBlanc, "Writing Secure Code", Microsoft Press, 2nd Edition, 2003.

References:

1. Robert C. Seacord, "Secure Coding in C and C++", Pearson Education, 2nd edition, 2013.

2. Julia H. Allen, Sean J. Barnum, Robert J. Ellison, Gary McGraw, Nancy R. Mead, "Software Security Engineering: A guide for Project Managers", Addison-Wesley Professional, 2008.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2											1	3
CO2	3	2											2	2
CO3	3	2	1	1	2								3	2
CO4	2	2	2	2									1	1
Average	2.75	2	1.5	1.5	2								1.75	2
Level of correlation	3	2	1	1	2								2	2

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester ,CSE

L	T	P	C
3	1	-	4

20ACS63 UBIQUITOUS SENSING, COMPUTING AND COMMUNICATION

COURSE OUTCOMES:

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

1. Describe the characteristics of pervasive computing applications
2. Analyze the strengths, problems and limitations of the current tools, devices and Communications for pervasive computing systems.
3. Recognize the different ways that humans will interact with systems in a ubiquitous Environment and account for these accordingly.
4. Develop an attitude to identify and propose solutions for security and privacy issues.
5. Explore the trends and problems of current pervasive computing systems using examples.

UNIT-I BASICS AND VISION 11 Hrs

Living in a Digital World, Illustrative Ubiquitous Computing Applications, Holistic Framework for UbiCom: Smart DEI, Modeling the Key Ubiquitous Computing Properties, Core Properties of UbiCom Systems, Distributed ICT Systems, implicit Human Computer Interaction (iHCI), Context Awareness, Autonomy, Intelligence, Ubiquitous System Environment Interaction, Architectural Design for UbiCom Systems, Smart Devices, Smart Environments, Smart Interaction.

UNIT-II SMART DEVICES AND SERVICES 9 Hrs

Introduction, Service Architecture Models, Service Provision Life Cycle, Service Invocation, Service Composition, Virtual Machines and Operating Systems, Virtual Machines, BIOS, Multi Tasking Operating Systems (MTOS), Process Control, Memory Management, Input and Output

UNIT-III TAGGING, SENSING AND CONTROLLING 8 Hrs

Introduction, Tagging the Physical World, Sensors and Sensor Networks, Micro Actuation and Sensing: MEMS, Embedded Systems and Real Time Systems, Control Systems (for Physical World Tasks), Robots.

UNIT-IV UBIQUITOUS COMMUNICATION 11 Hrs

Introduction, Audio Networks, Data Networks, Wireless Data Networks, Universal and Transparent Audio, Video and Alphanumeric Data Network Access, Ubiquitous Networks, Further Network Design Issues, Managing Smart Devices in Virtual Environments, Managing Smart Devices in Physical Environments.

UNIT-V UBIQUITOUS SYSTEM: CHALLENGES AND OUTLOOK 8 Hrs

Introduction, Overview of Challenges, Smart Devices, Smart Interaction, Smart Physical Environment Device Interaction, Smart Human Device Interaction, Human Intelligence versus Machine Intelligence, Social Issues: Promise versus Peril.

TOTAL: 48 PERIODS

TEXT BOOK:

1. Stefan Poslad, Queen Mary "Ubiquitous Computing Smart Devices, Environments and Interactions, John Wiley and Sons, Ltd, Publication

REFERENCE BOOK

1. N. Jeyanthi, Ajith Abraham, Hamid Mcheick, "Ubiquitous Computing and Computing Security of IoT".
2. John Krumm, Ubiquitous Computing Fundamentals, CRC Press.
3. Dirk Slama, "Enterprise IoT", Shroff Publisher/O'Reilly Publisher
4. Dr. Jeeva Jose, Internet of Things, Khanna Publishing House.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	3											3	2
C02	2	3	2		2								2	2
C03	3	2											1	3
C04	3	2	3	2	3								1	1
C05	2	2												2
Average	2.6	2.4	2.5	2	2.5								1.75	2
Level of correlation	2	2	3	3	3								2	2

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

III B.Tech II Semester ,CSE

L	T	P	C
3	1	-	4

20ACS64 **Storage Area Networks**

Course outcomes:

The students should be able to:

1. Identify key challenges in managing information
2. Understanding protection of data
3. analyze different storage networking technologies and virtualization
4. Describe types of backup and archives.
5. Illustrate the storage infrastructure and management activities

Unit-1: information storage and Data Center Environment **12 hours**

Introduction to information storage, Information Storage , Evolution of Storage Architecture Data Center Infrastructure , Virtualization and Cloud Computing, Data Center Environment- Application**,** Host (Compute), Connectivity, Storage, Disk Drive Components, Disk Drive Performance, Host Access to Data, Direct-Attached Storage, Storage Design Based on Application, Disk Native Command Queuing, Introduction to Flash Drives

Unit-2 : Data Protection and Intelligent Storage Systems **12 hours**

RAID Implementation Methods, RAID Array Components, RAID Techniques RAID Levels, RAID Impact on Disk Performance, RAID Comparison, Components of an Intelligent Storage System, Storage Provisioning, Types of Intelligent Storage Systems

Unit-3: Storage Networking Technologies 12 hours

Fibre Channel Storage Area Networks: Fibre Channel: Overview, The SAN and Its Evolution, Components of FC SAN, FC Connectivity, Switched Fabric Ports, Fibre Channel Architecture, Fabric Services, Zoning, FC SAN Topologies, General-Purpose Servers versus NAS Devices, Benefi ts of NAS, File Systems and Network File Sharing, Components of NAS, NAS I/O Operation

Unit-4: Backup and Archive 12 hours

Introduction to Business Continuity: Information Availability, BC Terminology, BC Planning Life Cycle, Failure Analysis, Business Impact Analysis, BC Technology Solutions , Backup and Archive: Backup Purpose, Backup Considerations, Backup Granularity, Recovery Considerations, Backup Methods, Backup Architecture, Backup and Restore Operations, Backup Topologies, Backup in NAS Environments, Data Deduplication for Backup

Unit-5: Securing and Managing Storage Infrastructure 12 hours

Securing the Storage Infrastructure: Information Security Framework, Risk Triad, Storage Security Domains, Security Implementations in Storage Networking, NAS, IP SAN, Securing Storage Infrastructure in Virtualized and Cloud Environments, Concepts in Practice: RSA and VMware Security Products

Text Books:

1. Information Storage and Management,Author :EMC Education Services, Publisher: Wiley ISBN: 9781118094839

CO-PO MAPPING

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3											2	2
CO2	3	2											2	3
CO3	2	3	2	2									2	2
CO4	2	2		2									2	1
CO5	3	2	1	2	3								2	2
Average	2.4	2.4	1.5	2	3								2	2
Level of correlation	3	3	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

L	T	P	C
3	1	-	4

20ACS65 **Fuzzy Logic And Knowledge based Systems**
(Honors Degree)

Course Outcomes:

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

1. Comprehend the concepts of feed forward neural networks
2. Analyse the various feed back networks
3. Understand the concept of fuzziness involved in various Systems and fuzzy set theory.4
4. Comprehend the fuzzy logic control and adaptive fuzzy logic and to design the fuzzy control using genetic algorithm.
5. Analyse the application of fuzzy logic control to real time systems

UNIT I 8 Hrs

Introduction To Fuzzy Logic Principles: Basic concepts of fuzzy set theory, operations of fuzzy sets, properties of fuzzy sets, Crisp relations, Fuzzy relational equations, operations on fuzzy relations,

fuzzysystems,propositionallogic,Inference,PredicateLogic,Inferenceinpredicatelogic,fuzzylogic principles, fuzzy quantifiers, fuzzy inference, fuzzy rule based systems, fuzzification and defuzzification types.

UNIT II 8 Hrs

Advanced Fuzzy Logic Applications: Fuzzy logic controllers, principles, review of control systems theory, various industrial applications of FLC adaptive fuzzy systems, fuzzy decision making,Multiobjectivedecisionmaking,fuzzyclassification,meansclustering,fuzzypatternrecognition,i ma geprocessingapplications,syntacticrecognition, fuzzy optimization.

UNIT III 8 Hrs

Membership Functions: Features of the Membership Function, StandardForms and Boundaries, Fuzzification, Membership Value Assignments, Intuition, Inference, Rank Ordering, Angular Fuzzy Sets, Neural Networks, Genetic Algorithms, Inductive Reasoning.

UNIT IV 8 Hrs

Introduction To Artificial Neural Networks: Fundamentals of neural networks, model of an artificial neuron, neural network architectures, Learning methods, Taxonomy of Neural network architectures, Standard back propagation algorithms, selection of various parameters, variations Applications of back propagation algorithms.

UNIT V 8 Hrs

Recent Advances: Fundamentals of genetic algorithms, genetic modeling, hybrid systems, integration of fuzzy logic, neural networks and genetic algorithms, nontraditional optimization techniques like ant colony optimization, Particle swarm optimization and artificial immune systems, applications in design and manufacturing.

Text books

1. S. Rajasekaran, G.A. Vijayalakshmi Pai, "Neural Networks, fuzzy logic and genetic algorithms",

   Prentice Hall Publications, 2017.

2. Timothy J. Ross, "Fuzzy Logic with Engineering Applications", McGraw Hill, 2011.

Reference Books

1. ZuradaJ.M."Introduction to Artificial NeuralSystems",Jaico publishinghouse,2004**.**

2. Klir. G, Yuan B.B. "Fuzzy Sets and Fuzzy Logic",Prentice Hall of India PrivateLimited,1997.

3. Gen, M. and R. Cheng" Genetic algorithm and engineering design", John Wiley Publications, 1997

4. Laurance Fausett, "Fundamentals of Neural Networks ", Prentice Hall,1992

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3											2	2
CO2		1	2	3			2						1	2
CO3	2	3	2	2			3	2			2	3	1	3
CO4	2	2		2				1					2	2
CO5	1	1		2				1					2	2
Average	1.75	2	2	2.25			2.5	2			2	3	1.6	2.2
Level of correlation	2	2	2	2			3	2			2	3	2	2

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester ,CSE

L	T	P	C
3	1	-	4

20ACS66 **Vulnerability Assessment and Penetration Testing**

Course outcome:

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

1. Gain knowledge about the basic principles for Information Gathering and Detecting Vulnerabilities in the system
2. Determine the security threats and vulnerabilities in computer networks using penetration testing techniques
3. Explain the various protocols defined for various network and server application.
4. Execute the acquired knowledge into practice for testing the vulnerabilities and identifying threats using penetration tools.

UNIT-I 8Hrs

Information Gathering: Introduction - Terminologies - Categories of Penetration Testing - Penetration Testing Reports - Information Gathering Techniques - Active, Passive and Sources of Information Gathering - Approaches and Tools - Traceroutes, Neotrace, Whatweb, Netcraft, Xcode Exploit Scanner and NSlookup. Host discovery - Scanning for open ports and services - Types of Port scanning.

UNIT-II 10Hrs

Host Discovery And Evading Techniques: Vulnerability Scanner Function, pros and cons - Vulnerability Assessment with NMAP - Test ing SCADA environment with NMAP - Nessus Vulnerability Scanner - Safe check - Silent dependencies - Port Range Vulnerability Data Resources

UNIT-III 8Hrs

Network Sniffing: Introduction, Types of Sniffing, Active Sniffing, Passive Sniffing, Hubs versus Switches, Promiscuous versus Non promiscuous Mode, MITM Attacks, ARP Protocol Basics, How ARP Works, ARP Attacks, MAC Flooding, Macof, ARP Poisoning, Scenario—How It Works, Denial of Service Attacks, Tools of the Trade, Dsniff.

UNTI IV 9Hrs

Remote Exploitation: Understanding Network Protocols, Transmission Control Protocol, User Datagram Protocol, Internet Control Messaging Protocol, Server Protocols, Binary Protocols, FTP, SMTP,HTTP, Resources, Attacking Network Remote Services, Overview of Brute Force Attacks, Traditional Brute Force, Dictionary Attacks, Hybrid Attacks, Common Target Protocols.

UNIT-V 8Hrs

Client Side Exploitation:

Attack Scenario 1: E-Mails Leading to Malicious Attachments

Attack Scenario 2: E-Mails Leading to Malicious Links

Attack Scenario 3: Compromising Client Side Update

Attack Scenario 4: Malware Loaded on USB Sticks

TEXT BOOK:

1. Rafay Baloch, Ethical Hacking and Penetration Testing Guide, CRC Press, 2015. ISBN : 78-1-4822-3161-8.
2. Dr. Patrick Engebretson, The Basics of Hacking and Penetration Testing Ethical Hacking and Penetration Testing made easy , Syngress publications, Elsevier, 2013. ISBN :978-0-12-411644-3

REFERENCE BOOKS:

1. Abhinav Singh, Metasploit Penetration Testing Cookbook, PACKT Publishing, 2012. ISBN 978-1-84951-742-3
2. Ami, P., & Hasan, A. (2012). Seven phrase penetration testing model. *International Journal of Computer Applications*, *59*(5), 16-20.

CO-PO MAPPING

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

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

HONORS DEGREE

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

L	T	P	C
3	1	-	4

20ACS67 **Speech Processing**

COURSE OUTCOMES:

On Successful completion of the course Students will be able to

1. Create new algorithms with speech processing
2. Derive new speech models
3. Perform various language phonetic analysis
4. Create a new speech identification system
5. Generate a new speech recognition system

UNIT I **9 Hrs**

Introduction – Regular Expressions, Text Normalization, Edit Distance - Regular Expressions - Words - Corpora - Text Normalization - Minimum Edit Distance.

UNIT II **9 Hrs**

N- Gram Language Models: N-Grams - Evaluating Language Models - Generalization and Zeros – Smoothing - Kneser-Ney Smoothing

Naive Bayes and Sentiment Classification: Naive Bayes Classifiers - Training the Naive Bayes Classifier - Worked example - Optimizing for Sentiment Analysis - Naive Bayes for other text classification tasks - Naive Bayes as a Language Model

UNIT III **9 Hrs**

Logistic Regression: Classification: the sigmoid - Learning in Logistic Regression -The cross-entropy loss function - Gradient Descent – Regularization - Multinomial logistic regression - Interpreting models

UNIT IV **9 Hrs**

Neural Networks and Neural Language Models: Units - The XOR problem - Feed-Forward Neural Networks - Training Neural Nets - Neural Language Models

Sequence Labeling for Parts of Speech and Named Entities: English Word Classes - Part-of-Speech Tagging - Named Entities and Named Entity Tagging - HMM Part-of-Speech Tagging - Conditional Random Fields (CRFs) - Evaluation of Named Entity Recognition

UNIT V **9 Hrs**

Language Models Revisited: Recurrent Neural Networks - Managing Context in RNNs: LSTMs and GRUs - Self-Attention Networks: Transformers - Potential Harms from Language Models

TEXT BOOK:

1. Daniel Jurafsky and James H. Martin, ― Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition, Person education,2013.

REFERENCE BOOKS:

1. Kai-Fu Lee, ―Automatic Speech Recognition, The Springer International Series in Engineering and Computer Science, 1999.

2. Himanshu Chaurasiya, ―Soft Computing Implementation of Automatic Speech Recognition, LAP Lambert Academic Publishing, 2010.

3. Claudio Becchetti, Klucio Prina Ricotti, ―Speech Recognition: Theory and C++ implementation,Wiley publications 2008.

CO- PO MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	2	3	-	-	-	-	-	-	-	-	2	2
CO2	3	2	3	3	-	-	-	-	-	-	-	-	3	3
CO3	3	2	1	1	-	-	-	-	-	-	1	-	3	2
CO4	3	-	2	-	2	-	-	-	-	1	-	-	2	3
CO5	2	3	3	-	2	-	-	-	-	-	-	-	3	2
Average	2.6	2.5	2.2	2.33	2					1	1		2.6	2.4
Level of correlation	3	3	2	2	2					1	1		3	3

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester ,CSE

L	T	P	C
3	1	-	4

20ACS68 **Networking Essentials**

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

1. Understand wired network and wireless network.
2. Demonstrate Structured Cabling and Horizontal Cabling
3. Configuring Point-to-Point multipoint wireless networks
4. Describe the function of a router when used to interconnect LAN.
5. Understand the four layers of TCP/IP Model.

UNIT - I:

Network Topologies, The OSI Model, The Ethernet LAN, Home Networking, Assembling an Office LAN, Testing and Troubleshooting a LAN

UNIT - II: Physical Layer cabling:

Twisted Pairs: Structured Cabling, Horizontal Cabling, and Twisted pair cable: UTPs and STPs, Terminating Twisted pair cable, cable testing and troubleshooting, 10 GB Ethernet over copper, Troubleshooting cabling system.

UNIT - III: Wireless Networking

Introduction, IEEE 802.11 wireless LAN standard, Bluetooth, WiMax, RFID, Cellular Communications, configuring Point-to-Point multipoint wireless networks, Troubleshooting wireless network.

UNIT - IV: Interconnecting the LAN

The Network Bridge, The Network Switch, The Router, The console port Connection

UNIT - V: TCP/IP : introduction,The TCP/IP layers,Number Conversion,IPV4 Addressing, Subnet masks: subnetting and supernetting,IPV6 Adressing.

Text Books:

1. Networking Essentials: A CompTIA Network+ N10-007 Textbook, Jeffrey S. Beasley, Piyasat Nilkaew, Pearson Education.

2. Cisco Networking Essentials, Troy McMillan, Wiley, 2015.

References:

1. Cisco Networking Essentials for Educational Institutions, CISCO Press.

2. Guide to Networking Essentials, Greg Tomsho, Cengage Learning, 2015.

3. Networking Essentials, CISCO Networking Academy (www.netacad.com)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	**3**	**1**	**2**	**2**									**2**	**3**
C02	**2**	**2**	**1**	**1**	**2**								**3**	**2**
C03	**2**	**1**	**2**	**2**	**1**								**2**	**2**
C04	**2**	**2**	**2**	**1**									**3**	**1**
C05	**3**	**2**	**1**	**2**									**3**	**2**
Average	**2.4**	**1.6**	**1.6**	**1.6**	**1.5**								**2.6**	**2**
Level of correlation	**3**	**2**	**2**	**2**	**2**								**33**	**2**

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester ,CSE

L	T	P	C
3	1	-	4

20ACS69 **Neural Network**

Course Outcomes:

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

1. Identify the features and characteristics of ANN
2. Demonstrate the types, Classification and Learning Strategy.
3. Implement Training Algorithm for Discrete and Continuous Perceptron
4. Formalize the problem, to solve it by using a neural network.
5. Understand the various memory concept

UNIT – I **8 Hrs**

INTRODUCTION TO NEURAL NETWORKS.

Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN.

UNIT – II **8 Hrs**

ESSENTIALS OF ARTIFICIAL NEURAL NETWORKS.

Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron, Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules.

UNIT – III **8 Hrs**

SINGLE LAYER FEED FORWARD NETWORKS.

Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Limitations of the Perceptron Model.

UNIT – IV

MULTI- LAYER FEED FORWARD NETWORKS. **8 Hrs**

Credit Assignment Problem, Generalized Delta Rule, Derivation of Back propagation (BP) Training, Summary of Back propagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

UNIT - V **10 Hrs**

ASSOCIATIVE MEMORIES.

Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory, Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function.

Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis. Neural network applications: Process identification, control, fault diagnosis.

TEXT BOOK

1. Laurene Fausett, "Fundamentals of Neural Networks" , Pearson Education, 2004..
2. Simon Haykin, "Neural Networks- A comprehensive foundation", Pearson Education, 2003

REFERENCE

1.S.N.Sivanandam, S.Sumathi,S. N. Deepa "Introduction to Neural Networks using MATLAB 6.0", TATA Mc Graw Hill, 2006.

2. S. Rajasekharan and G. A. Vijayalakshmi pai, "Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications", PHI Publication, 2004.

3. Timothy J. Ross, " Fuzzy Logic With Engineering Applications", Tata McGraw Hill Inc. 2000.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2										3	2
CO2	3	2	2										3	2
CO3	3	2	2	1	2								2	3
CO4	3	2	1		1								3	2
CO5	3	2											2	3
Average	3	2.2	1.4	1	1.5								2.6	2.4
Level of correlation	3	2	1	1	2								3	

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester ,CSE

L	T	P	C
3	1	-	4

20ACS70 **Malware Analysis**

COURSE OUTCOME

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-1 : BASIC STATIC TECHNIQUES **12hrs**

Antivirus Scanning, Hashing: A Fingerprint for Malware, Finding Strings, Packed and Obfuscated Malware, 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-2 : BASIC DYNAMIC ANALYSIS **12hrs**

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**,** Levels of Abstraction, Reverse-Engineering, The x86 Architecture.

UNIT-3 : RECOGNIZING C CODE CONSTRUCTS IN ASSEMBLY **12hrs**

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-4 : ADVANCED DYNAMIC ANALYSIS **12hrs**

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-5 : 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

CO-PO Mapping

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

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester ,CSE

L	T	P	C
3	1	-	4

20ACS71 **Advanced Computer Vision**

Course outcome:

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

1. Identify basic concepts, terminology, theories, models and methods in the field of computer vision
2. Perform shape analysis and implement boundary tracking techniques which are the basics of image processing
3. Apply appropriate algorithm based on the optimization
4. Develop applications using deep learning and recognition models

UNIT-I 8Hrs

Image Formation: Computer vision, brief history, 2D transformations ,3D transformations , 3D rotations , 3D to 2D projections ,Lens distortions , Photometric image formation, Lighting , Reflectance and shading , Optics,The digital camera ,Sampling and aliasing , Color, Compression .

UNIT-II 10Hrs

Image Processing: Point operators: Pixel transforms, Color transforms, Compositing and matting. **Histogram equalization. Application:** Tonal adjustment, Linear filtering, Separable filtering, Examples of linear filtering, Band-pass and steerable filters, More neighborhood operators, Non-linear filtering, Bilateral filtering, Binary image processing, Fourier transforms, Two-dimensional Fourier transforms. Application: Sharpening, blur, and noise removal, Pyramids and wavelets, Interpolation, Decimation, Multi-resolution representations Wavelets. Application: Image blending, Geometric transformations, Parametric transformations, Mesh-based warping, Application:Feature-based morphing.

UNIT-III 7Hrs

Model Fitting And Optimization: Scattered data interpolation, Radial basis functions, Overfitting and underfitting, Robust data fitting, Variational methods and regularization, Discrete energy minimization, Total variation, Bilateral solver, Application: Interactive colorization, Markov random fields, Conditional random fields, Application: Interactive segmentation.

UNIT-IV 8Hrs

Deep Learning: Supervised learning, Nearest neighbors, Bayesian classification, Logistic regression, Support vector machines, Decision trees and forests, Unsupervised learning, Clustering, K-means and Gaussians mixture models, Principal component analysis, Manifold learning, Semi-supervised learning, Deep neural networks, Weights and layers, Activation functions, Regularization and normalization, Loss functions, Back propagation, Training and optimization, Convolution neural networks, Pooling and unspooling, Application: Digit classification, Generative models.

UNIT-V 8Hrs

Recognition: Instance recognition, Image classification, Feature-based methods, Deep networks. Application: Visual similarity search, Face recognition, Object detection, Face detection, Pedestrian detection, General object detection, Semantic segmentation, Application: Medical image segmentation, Instance segmentation, Panoptic segmentation, application: Intelligent photo editing.

TEXT BOOK:

1. Szeliski, R. (2021). Computer vision: algorithms and applications. Springer Science & Business Media.

2. D. L. Baggio et al., ―Mastering Open CV with Practical Computer Vision Projects‖, Packt Publishing, 2012.

3. E. R. Davies, ―Computer & Machine Vision‖, Fourth Edition, Academic Press, 2012.

REFERENCE BOOKS:

1. Jan Erik Solem, ―Programming Computer Vision with Python: Tools and algorithms for analyzing images‖, O'Reilly Media, 2012.

2. Mark Nixon and Alberto S. Aquado, ―Feature Extraction & Image Processing for Computer Vision‖, Third Edition, Academic Press, 2012.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	**3**												**3**	**2**
C02	**3**	**1**		**2**	**2**								**3**	**3**
C03	**3**	**3**	**3**										**3**	**2**
C04	**3**	**2**	**3**	**3**	**3**								**3**	**1**
C05	**3**	**3**	**2**	**1**	**3**								**3**	**2**
Average	**3**	**2.25**	**2.66**	**2**	**2.66**								**3**	**2**
Level of correlation	**3**	**3**	**3**	**2**	**3**								**3**	**2**

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

HONORS DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester ,CSE

L	T	P	C
3	1	-	4

20ACS72 **High Performance Computing**

Course outcome:

At the end of the course the student 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 cloud federations, Observations , Third-party cloud services, MetaCDN SpotCloud

TEXT BOOK:

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

REFERENCE BOOKS:

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

CO-PO MAPPING:

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

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

MINOR DEGREE IN BLOCK CHAIN

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

II B.Tech II Semester-CSE

L	T	P	C
3	1	-	4

20ACS73 FUNDAMENTALS OF BLOCK CHAIN

Course Outcomes:

After Completion of the course the student will be able to

1. Familiarize the functional/operational aspects of cryptocurrency ECOSYSTEM.
2. Understand emerging abstract models for Block chain Technology.
3. Identify major research challenges and technical gaps existing between theory and practice in cryptocurrency domain

UNIT I **8 hrs**

The consensus problem - Asynchronous Byzantine Agreement - AAP protocol and its analysis - Nakamoto Consensus on permission-less, nameless, peer-to-peer network - Abstract Models for BLOCKCHAIN - GARAY model - RLA Model - Proof of Work (PoW) as random oracle - formal treatment of consistency, liveness and fairness - Proof of Stake (PoS) based Chains - Hybrid models (PoW + PoS) .

UNIT II **7 hrs**

cryptographic basics for cryptocurrency - a short overview of Hashing, signature schemes, encryption schemes and elliptic curve cryptography

UNIT III **9 hrs**

Bitcoin - Wallet - Blocks - Merkley Tree - hardness of mining - transaction verifiability - anonymity - forks - double spending - mathematical analysis of properties of Bitcoin.

UNIT IV **7 hrs**

Ethereum - Ethereum Virtual Machine (EVM) - Wallets for Ethereum - Solidity - Smart Contracts - some attacks on smart contracts.

UNIT V **7 hrs**

Zero Knowledge proofs and protocols in Blockchain - Succinct non interactive argument for Knowledge (SNARK) - pairing on Elliptic curves - Zcash.

TEXT BOOKS:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press,

2016.

REFERENCE BOOKS:

1. Joseph Bonneau et al, SoK: Research perspectives and challenges for Bitcoin and cryptocurrency, IEEE Symposium on security and Privacy, 2015

2. J.A.Garay et al, The bitcoin backbone protocol - analysis and applications EUROCRYPT 2015 LNCS VOl 9057, (VOLII), pp 281-310.

3. R.Pass et al, Analysis of Blockchain protocol in Asynchronous networks, EUROCRYPT 2017, (eprint.iacr.org/2016/454) .

4. R.Pass et al, Fruitchain, a fair blockchain, PODC 2017 (eprint.iacr.org/2016/916).

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	-	-	-	-	-	-	-	-	-	-	3	1
CO2	3	2	-	-	-	-	-	-	-	-	-	-	3	1
CO3	2	2	1	3	-	-	-	-	-	-	-	-	2	2
Average	2.66	2.33	1	3									2.33	1.33
Level of correlation	3	3	1	3									3	1

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

MINOR DEGREE IN BLOCK CHAIN

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

L	T	P	C
3	1	-	4

20ACS74 SMART CONTRACTS AND SOLIDITY (Minor Degree)

Course Outcomes:

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

1. Understand the basics and objectives of Smart Contracts in a Blockchain.
2. Evaluate the various functionalities and features in an Ethereum to generate Smart Contracts.
3. Understand the Solidity language in creation of a Smart Contracts.
4. Incorporate Smart Contracts in decentralized applications.

UNIT- I 9 Hrs

Introduction to Smart Contracts: Ethereum: Asynchronized Cryptography, Cryptographic hash functions, peer-to-peer network, blockchain, Ethernum virtual machine, Node, Miner, Proof of Work, Decentralized App, Solidity, Smart Contract, GAS, Ehter, Account, Transaction, Preparation: Tool preparation, Testing Environment, Ethereum source code compilation.

UNIT-II 9Hrs

Ethereum Virtual Machine (EVM): Introduction to virtual machines, The role of the Ethereum protocol in banking, Anyone can make a banking platform, What the EVM Does, EVM applications, Understanding state machines, How the Guts of the EVM work, Blocks: The history of state changes.

UNIT-III 9Hrs

Solidity Basics: Solidity Basics, Sol File structure, Structure of contract, variables, operators, statement, Data location, Modifier, Event, Inheritance, Miscellaneous

UNIT-IV 9Hrs

Application Binary Interface: Memory structure, Function selector, Type definition, Data presentation in EVM, Encode, ABI programming. Operation principles of smart contract: Design pattern.

UNIT-V 9Hrs

Application : Develop Secure Contract: History, Attacking Vector, Ethernum smart contract: Best practices, Code audit, Decentralized Application: Feature, DApp architecture, Ethernum DApp, IPFS DApp,

TEXT BOOK:

1. Gavin Zheng, Longxiang Gao, Liqun Huang, Jian Guan, Ethereum Smart Contracts Development in Solidity, 2021, 1st Edition, Springer Singapore.
2. Dannen, C., Introducing Ethereum and solidity, 2017, (Vol. 318). Berkeley: Springer

REFERENCE BOOKS:

6. Modi, Ritesh, Solidity Programming Essentials: A beginner's guide to build smart contracts for Ethereum and Blockchain, 2018, Packt Publishing Ltd, United Kingdom.
7. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfeder, Bitcoin and cryptocurrency technologies: a comprehensive introduction, 2016, Princeton University Press

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	2	1	-	-	-	-	-	-	-	-	-	2	1
C02	3	2	2	-	-	-	-	-	-	-	-	-	3	2
C03	3	2	-	-	-	-	-	-	-	-	-	-	2	1
C04	3	2	2	2	-	-	-	-	-	-	-	-	3	2
Average	3	2	1.66	2									2.5	1.5
Level of correlation	3	2	2	2									3	2

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

MINOR DEGREE IN BLOCK CHAIN

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester CSE

L	T	P	C
3	1	-	4

20ACS75 BLOCKCHAIN PLATFORMS AND USE CASES
(Minor Degree)

Course Outcomes: After completion of course, students would be able to:

1. Analyse different types of blockchain platforms.
2. Understand different types of uses of blockchain and apply it to some real-life scenarios
3. Acquire knowledge of the shortcomings of blockchain technology and their corresponding solutions.

UNIT-I: Introduction to Blockchain: **9hrs**

Various technical definition of Blockchain, Generic Elements of Block chain , Feature of Blockchain, Types of Blockchain: Public blockchains, private block chains semi-private blockchains, sidechains, Permissioned ledger, Distributed ledger, Shared ledger, Fully private and proprietary blockchains.

Unit-II: Decentralized Application Platforms: 9**hrs**

Decentralization using blockchain, Methods of decentralization, Route of decentralization Blockchain and full ecosystem decentralization, Decentralized organization, Decentralized applications.

Platforms for decentralization,

Unit-III: Blockchain Platforms: 9hrs

Bitcoin, Bitcoin definition, transaction. Blockchain, The bitcoin network, Wallets, wallet types, Non-deterministic wallets, deterministic wallets, hierarchical determistic wallets, Brain wallets, Paper wallets, Hardware wallets, Online wallets, Mobile wallets.

Unit-IV: Alternative Blockchain: 9**hrs**

Kadena, Ripple, transaction, Stellar, Rootstock, Quorum; transaction manager, crypto enclave, Quorumchain, Network manager, Tezos: StorJ, Maidsafe, BigchainDB, Tendermint.

Unit-V: Blockchain Use Cases: 9**hrs**

Financial Services Related Use Cases, Multinational policy management, Government, Supply

Chain Management, Healthcare Related Services: Electronic medical records, Healthcare payment preauthorization,

Text Books/References:

1. Tiana Laurence, Blockchain for Dummies, 2nd Edition 2019, John Wiley & Sons.

2. Anshul Kaushik, Block Chain & Crypto Currencies, Khanna Publishing House.

3. Building Blockchain Projects, Narayan Prusty, Packt Publishing.

4. Mastering Blockchain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Blockchain frameworks by Imran Bashir, Packt Publishing (March 17, 2017).

5. Blockchain: Blueprint for a New Economy by Melanie Swan, Shroff Publisher publisher/O'Reilly Publisher Media; 1st edition (2015).

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**1**
CO2	**3**	**3**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**1**
CO3	**3**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**
Average	**3**	**2.66**	**2.33**	**1.66**									**2.66**	**1.33**
Level of correlation	**3**	**3**	**3**	**2**									**3**	**1**

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOU)

III B.Tech II Semester -CSE

L	T	P	C
3	1	-	4

20ACS76 BLOCKCHAIN SECURITY AND PERFORMANCE (Minor Degree)

Course Outcomes:

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

1. Analyze the security and performance perspective of blockchain technology.
2. Apply security analysis and performance-enhancing techniques related to blockchain.
3. Apply blockchain technology and apply it to provide solutions to some real-life problems.

UNIT-I 9 Hrs

Security Issues

Blockchain Related Issues, Higher-Level Language (Solidity) Related Issues, EVM Bytecode Related Issues, Real-Life Attacks on Blockchain Applications/ Smart Contracts, Trusted Execution Environments

Unit-II

Security Tools for Smart Contracts

Working, Advantages, And Disadvantages of Tools- Oyente, Securify, Maian, Manticore, Mythril, SmartCheck, Verx. Secure Key Management, Quantum Resilience Keys.

Unit-III 9 Hrs

Performance Related Issues

Transaction Speed, Transaction Fees, Network Size, Complexity, Interoperability Problems, Lack of Standardization. Lack of Supportive Regulations Related to Blockchain Applications.

Unit-IV 9 Hrs

Performance Improvements

Off-Chain State Channels, Sidechains, Parallels Chains, Concurrent Smart Contract Transactions, Sharding Technique and Its Benefits, Atomic Swaps Between Smart Contracts

Unit-V 9 Hrs

Blockchain Applications

Decentralized Cryptocurrency, Distributed Cloud Storage, EVoting, Insurance Claims, Cross-Border Payments, Asset Management, Smart Appliances.

Text Books:

1. Mastering Ethereum: Building Smart Contracts and Dapps Book by Andreas Antonopoulos and Gavin Wood, Shroff Publisher/OReilly Publisher.

References Books:

1. Mastering Blockchain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Blockchain frameworks by Imran Bashir, Packt Publishing (March 17, 2017).

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**
CO2	**3**	**3**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**
CO3	**3**	**3**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**
Average	**3**	**3**	**2.66**	**1.33**	**1**								**3**	**3**
Level of correlation	**3**	**3**	**3**	**2**	**1**								**3**	**3**

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

MINOR DEGREE IN BLOCK CHAIN

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester -CSE

L	T	P	C
3	1	-	4

20ACS77 BLOCKCHAIN AND FINTECH

Course Outcomes:

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

1. Understand the concepts of Initial Coin Offerings.
2. Analyse Risks associated with DeFi.
3. Use the benefits of blockchain in banking sector.

UNIT –I 12Hrs

Cryptocurrencies

Concept, Cryptocurrency Mining, Uses of Cryptocurrencies, Tokens, Token vs Crypto Coin, Concept of ICOs (Initial Coin Offerings), Benefits of Using ICOs, STOs (Security token offerings), ICO vs STO, Cryptocurrency wallets.

Unit -II 12Hrs

Decentralized Finance (DeFi)

Concept, Benefits and Risks Associated with DeFi, Centralized vs Decentralized finance, DeFi Projects, DeFi future trends.

Unit –III 12Hrs

Decentralized Markets

Concept of Decentralized markets, impact of decentralization on financial market, Decentralized Exchanges (DEX), Security, control and privacy concerns related to DEX, Liquidity and Usability of DEX, best DEXs for trading, Fund Management and Trading logic of DEX, Concept of Decentralized Web.

Unit –IV 12Hrs

Blockchain & Cryptocurrency Regulations

Introduction, History Stance of the Government, Judicial Approach to Cryptocurrency, Possible Reasons for Ban, Virtual Currency Regulations, Global Perspective of Regulations on Blockchain, Future needs for Regulations.

Unit –V 12Hrs

Blockchain in Banking Sector

Cross-Border Payments Using Blockchain and Its Benefits, Study of blockchain platforms used for cross-border payments, Impact of Blockchain on Banking Services. Stable Coin: Concept, Uses and Types of Stable Coins Case-Study: Tether and Libra Coins

Text Books

1. Melanie Swan, Blockchain: Blueprint for a new economy, Shroff Publisher/O'Reilly Publisher.

2. Ron Quaranta, Blockchain in Financial Markets and Beyond: Challenges and Applications, Risk Books Publisher.

3. Richard Hayen, Blockchain & FinTech: A Comprehensive Blueprint to Understanding Blockchain & Financial Technology. - Bitcoin, FinTech, Smart Contracts, Cryptocurrency, Risk Books Publisher.

Corresponding Online Resources:

1. https://www.accenture.com/in-en/insight-blockchain-technology-how-banks building-real-time
2. https://medium.com/search?q=decentralized%20exchange
3. Emerging Technology Projection: The Total Economic Impact™ Of IBM Blockchain https://www.ibm.com/downloads/cas/QJ4XA0MD
4. https://www.coursera.org/learn/cryptocurrency

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**1**											**2**	**2**
CO2	**3**	**3**	**1**	**2**									**2**	**1**
CO3	**3**	**3**	**3**	**1**									**2**	**2**
Average	**3**	**2.33**	**2**	**1.5**									**2**	**1.66**
Level of correlation	**3**	**2**	**2**	**2**									**2**	**2**

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

MINOR DEGREE IN DATA SCIENCE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY [AUTONOMOUS]

II B. TECH I-SEMESTER CSE [DS], (Professional Elective Courses-I)

II B. TECH II-SEMESTER CSE (Minor in Data science)

L	T	P	C
3	1	0	4

20ACD05 DATA ANALYTICS

COURSE OUTCOMES

On completion of the course, student will be able to

1. Explain the fundamentals of Data Analytic processes and tools
2. Describe the phases of Data Analytic Lifecycle and its influence over Business Models.
3. Apply different Data Analytics techniques for Classification and Clustering problems.
4. Analyze data stream model and architecture to design and build Real Time Analytical applications.

UNIT 1 DATA ANALYTICS INTRODUCTION 10

Introduction – Challenges of conventional systems –Data Definitions - Web data – Organization/sources of data - Importance of data quality- Dealing with missing or incomplete data- Data Classification. Evolution of Analytic scalability, Analytic processes and tools, Analysis vs reporting - Modern data analytic tools, Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis vs Reporting.

UNIT 2 DATA ANALYTICS LIFE CYCLE 9

Data Analytics Lifecycle -Need of Data analytic lifecycle - Key roles for successful analytic projects - various phases of Data analytic lifecycle: Discovery - Data Preparation - Model Planning - Model Building -Communicating Results - Operationalization. Statistical concepts: Sampling distributions, resampling, statistical inference, prediction error - Business drivers for analytics - Typical analytical architecture.

UNIT 3 DATA ANALYTICS TECHNIQUES 9

Theory & Methods: Cluster Analysis- Association Rules – Apriori algorithm -Regression Analysis- Dispersion Analysis- Discriminant Analysis-Multivariate Analysis - Bayesian modeling inference and Bayesian networks - Naïve Bayesian classifiers- Decision Trees- Support vector and kernel methods.

UNIT 4 ADVANCED ANALYTICS 8

Analysis of time series: linear systems analysis, nonlinear dynamics - Rule induction - Neural networks: learning and generalization, competitive learning, principal component analysis and

neural networks; Fuzzy logic: extracting fuzzy models from data, fuzzy decision trees, Stochastic search methods.

UNIT 5 STREAMING ANALYTICS 9

Introduction to Streams Concepts – Stream data model and architecture - Stream Computing, Sampling data in a stream – Filtering streams – Counting distinct elements in a stream – Estimating moments – Counting oneness in a window – Decaying window - Realtime Analytics Platform (RTAP) applications - case studies - real time sentiment analysis, stock market predictions.

TOTAL=45Hrs.

TEXT BOOK

1. Michael Berthold, David J. Hand, Intelligent Data Analysis, Springer, 2007.
2. Trevor Hastie - Robert Tibshirani - Jerome Friedman - "The Elements of Statistical Learning", Springer,2011.

REFERENCE

1. Anand Rajaraman and Jeffrey David Ullman, Mining of Massive Datasets, Cambridge University Press, 2012.
2. Andrew G.Psaltis," Streaming DATA: Understanding the real-time pipeline", Manning Publications,2017.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3										3	3
CO2	3	3	2										2	2
CO3	3	3	2										2	3
CO4	3	2	2										3	2
Average	3	2.75	2.25										2.5	2.5
Level of Correlation	3	3	2										3	3

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. TECH I-SEMESTER (CSE [DS], CSE (AI & ML) (Job Oriented Elective Courses-I)
III B. TECH I-SEMESTER CSE (Minor in Data Science)

L	T	P	C
3	1	0	4

20ACD09 DISTRIBUTED DATABASE AND INFORMATION SYSTEMS

COURSE OUTCOMES:

- Describe the concepts of distributed relational database and query processing.
- Summarize distributed security techniques and database recovery.
- Apply the appropriate protocols for symmetric and asymmetric cryptosystems.
- Analyze the functions and components of Information system.
- Analyze the decision support system and tools for Business operations**.**

UNIT 1 INTRODUCTORY 9 Hrs.

Data Fragmentation - Replication and allocation techniques for DDBMS - Methods for designing and implementing DDBMS - designing a distributed relational database - Architectures for DDBMS - Cluster federated - parallel databases and client server architecture - Overview of query processing.

UNIT 2 DISTRIBUTED SECURITY 9 Hrs.

Overview of security techniques - Cryptographic algorithms - Digital signatures – Distributed Concurrency Control – Serializability theory - Taxonomy of concurrency control mechanisms - Distributed deadlocks – Distributed Database Recovery - Distributed Data Security - Web data management - Database Interoperability.

UNIT 3 ADVANCES IN DISTRIBUTED SYSTEMS 9Hrs

Authentication in distributed systems - Protocols based on symmetric cryptosystems - Protocols based on asymmetric cryptosystems - Password-based authentication - Unstructured overlays – Chord distributed hash table - Content addressable networks (CAN) - Tapestry - Some other challenges in P2P system design - Tradeoffs between table storage and route lengths - Graph structures of complex networks - Internet graphs - Generalized random graph networks.

UNIT 4 FUNDAMENTALAS OF INFORMATION SYSTEMS 9 Hrs.

Defining information – Classification of information – Presentation of information systems – Basics of Information systems – Functions of information systems – Components of Information systems- Limitations of Information systems – Information System Design.

UNIT 5 ENTERPRISE COLLOBRATION SYSTEMS 9 Hrs.

Groupware – Types of groupware – Enterprise Communication tools – Enterprise Conferencing tools – Collaborative work management tools – Information System for Business operations –

transaction processing systems – functional Information Systems – Decision Support systems – Executive Information systems – Online Analytical processing.

TOTAL=45Hrs

TEXT BOOKS

1. George Coulouris, Jean Dollimore, Tim Kindberg, "Distributed Systems Concepts and Design", Fifth Edition, Pearson Education Asia, 2012.
2. Ajay D. Kshemkalyani, MukeshSinghal, "Distributed Computing: Principles, Algorithms, and Systems", Cambridge University Press, 2008.

REFERENCE BOOKS

1. Distributed Databases - Principles and Systems; Stefano Ceri; Guiseppe Pelagatti; Tata McGraw Hill; 2006.
2. Ralph Stair and George Reynolds. , "Principles of Information Systems" Course Technology, Inc.,2006.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	-	-	-	-	-	-	-	-	-	3	2
CO2	3	2	3	-	-	-	-	-	-	-	-	-	3	2
CO3	3	3	2	-	-	-	-	-	-	-	-	-	3	3
CO4	3	2	2	-	-	-	-	-	-	-	-	-	3	2
CO5	3	2	1	-	-	-	-	-	-	-	-	-	2	3
Average	3	2.6	2	-	-	-	-	-	-	-	-	-	2.8	2.4
Level of Correlation	3	3	2	-	-	-	-	-	-	-	-	-	3	3

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B. TECH II-SEMESTER CSE(DS)-PE-II

III B. TECH II-SEMESTER CSE (Minor in Data science)

L	T	P	C
3	1	0	4

20ACD16 - DATA CENTRE AND NETWORKING TECHNOLOGIES

Course Outcome:
At the end of the course, the students should be able to:

- Explain the Fundamentals of Data Centre Design and Requirements of modern data repositories.
- Analyze the Network Connectivity and optimization standards for establishing Data Centre and Server Architectures.
- Analyze the concepts of clustering, scaling, optimization and virtualization of server architecture.
- Apply the techniques of Layer 2 Networks and Layer 3 Networks features and standards for Data Centre Application services.

UNIT I - EVOLUTION OF DATA CENTRE DESIGN 9 hrs

Design for flexibility, scalability, environmental control, electrical power, flooring, fire protection, security, network infrastructure. Energy use and greenhouse gas emissions. Requirements for modern data centres, high availability and Service Orientated Infrastructures (SOI). Modern data centre use case studies.

UNIT II - DATA CENTRE ARCHITECTURES 9 hrs

Network connectivity optimization evolution: Top of rack (TOR), end of rack (EOR), scale up vs scale up, solutions that reduce power and cabling. Data Centre standards; TIA/EIA-942. Structured cabling standards, fibre and copper cabling characteristics, cable management, bandwidth requirements, I/O connectivity.

UNIT III - SERVER ARCHITECTURES 9 hrs

Stand-alone, blades, stateless, clustering, scaling, optimization, virtualization. Limitation of traditional server deployments; modern solutions. Applications; database, finance etc. Redundant Layer 2 and Layer 3 designs. Case studies.

UNIT IV - LAYER 2 NETWORKS 9 hrs

Ethernet; IEEE 802.3ba; 40 Gbps and 100 Gbps Ethernet. IEEE 802.1D Spanning Tree Protocol (STP), RSTP, PVST, MSTP. TRILL (Transparent Interconnection of Lots of Links), RBridges, IEEE 802.1Qbg Edge Virtual Bridging, 802.1Qbh Bridge Port Extension. Fibre Channel over Ethernet (FCoE) vs Internet Small Computer System Interface (iSCSI). Data Center Bridging (DCB); priority-based flow control, congestion notification, enhanced transmission selection, Data Center Bridging Exchange (DCBX). Layer 2 Multicasting; Case studies.

UNIT V - LAYER 3 AND BEYOND **9 hrs**

Layer 3 Data Centre technologies, network virtualization. Protocols; IPv4, IPv6, MPLS, OSPF, IS-IS, BGP. OTV, VPLS layer 2 extension protocols. Locator Identifier Separation Protocol (LISP). Layer 3 Multicasting. Data centre application services. Data centre networking use case studies and the enabling technologies and protocols in the modern data centre.

TOTAL=45Hrs

TEXT BOOKS

1. SilvanoGai, Claudio DeSanti,"I/O Consolidation in the Data Center" Cisco Press; 1st edition [ISBN: 9781587058882]. 2009.
2. Kevin Corbin, Ron Fuller, David Jansen, "NX-OS and Cisco Nexus Switching: Next-Generation Data Center Architectures" Cisco Press; 1 edition [ISBN: 9781587058929], 2010.
3. SilvanoGai, TommiSalli, Roger Andersson, "Cisco Unified Computing System", Cisco Press; 1st edition, [ISBN: 9781587141935], 2010.

REFERENCES

1. Nash Darukhanawalla, Patrice Bellagamba, "Interconnecting Data Centers Using, VPLS" Cisco Press; 1 edition, [ISBN: 9781587059926], 2009.
2. Robert W. Kembel, Roger Cummings (Introduction), "The Fibre Channel, Consultant" Northwest Learning Assoc; 3rd Edition, [ISBN: 0931836840], 1998.
3. Robert W Kembal"Fiber Channel Switched Fabric" Northwest Learning, Associates, inc. [ISBN: 0931836719], 2009.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	3	3	-	-	-	-	-	-	-	-	-	3	2
C02	3	3	2	-	-	-	-	-	-	-	-	-	3	3
C03	3	2	2	-	-	-	-	-	-	-	-	-	3	2
C04	2	2	2	-	-	-	-	-	-	-	-	-	2	2
Average	2.75	2.5	2.25		-	-	-	-	-	-	-	-	2.75	2.25
Level of Correlation	3	3	2		-	-	-	-	-	-	-	-	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 [DS]
III B. TECH II-SEMESTER (CSE -Minor in Data Science)

L	T	P	C
3	0	0	3

20ACD18 INTRODUCTION TO MACHINE LEARNING: SUPERVISED LEARNING
(Open Elective/ Job Oriented Elective -II)

COURSE OUTCOMES

- Apply principles of Data Science to the analysis of business problems.
- Use data mining software to solve real-world problems.
- Apply algorithms to build machine intelligence.
- Analyze the machine learning algorithm to perform various data analysis.

UNIT I INTRODUCTION TO MACHINE LEARNING, LINEAR REGRESSION 9 hrs

Introduction-Simple Linear Regression-Least Squared Method- Model Fitness and R-squared - Coefficient Significance and Test Error

UNIT II MULTILINEAR REGRESSION 8 hrs

Linear Regression with Higher-Order Terms: Polynomial Regression-Bias-Variance Trade-Off Linear Regression with Multiple Features-Feature Selection, Correlation, and Interaction.

UNIT III LOGISTIC REGRESSION 8 hrs

Logistic Regression Introduction-Logistic Regression Optimization-Performance Metrics in Classification-Sklearn Library Usage and Examples.

UNIT IV NON-PARAMETRIC MODELS 8 hrs

Intro to Non-parametric and K-nearest Neighbors-Decision Tree Intro, Decision Tree Regressor Decision Tree Classifier, Metrics (Gini and Entropy)-Sklearn Usage, DT Hyperparameters and Early Stopping -Minimal Cost-complexity Pruning

UNIT V ENSEMBLE METHODS AND SUPPORT VECTOR MACHINE 12 hrs

Ensemble Method Intro: Random Forest-Boosting Introduction -AdaBoost Algorithm-Gradient Boosting-Support Vector Machine Introduction-Support Vector Machine: Soft Margin Classifier-Support Vector Machine: Kernel Trick-Support Vector Machine: Performance

TEXT /REFERENCE BOOKS

1. Introduction to Machine Learning with Python: A Guide for Data Scientists, by Andreas Muller
2. Zhi-Hua Zhou, “Ensemble Methods: Foundations and Algorithms”, CRC Press, 2012

REFERENCES

1. Monte F. Hancock, Jr. Practical Data Mining. 1st edition. Auerbach Publications, 2011.
2. Jain, V. K. Machine Learning. First edition. Khanna Book Publishing Company, 2019.

WEB REFERENCES

1. https://machinelearningmastery.com/stacking-ensemble-machine-learning-with-python/
2. https://www.coursera.org/learn/introduction-to-machine-learning-supervised-learning

CO Mapping

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

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

MINOR DEGREE IN DATA SCIENCE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B. TECH I-SEMESTER CSE

L	T	P	C
3	1	0	4

20ACD31 - TEXT ANALYTICS

COURSE OUTCOMES:

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

- Explain the methods for keyword extraction from documents.
- Identify different clustering techniques for grouping of textual documents.
- Apply classification algorithms for documents classification and detecting spams in email.
- Analyze the Feature extraction and event operations in Text streaming.

UNIT I TEXT EXTRACTION 9

Introduction- Rapid automatic keyword extraction: candidate keywords, keyword scores, adjoining keywords, extracted keywords-Benchmark evaluation: precision and recall, efficiency, stoplist generation, Evaluation on new articles.

UNIT II DOCUMENT CLUSTERING 9

Multilingual document clustering: Multilingual LSA, Tucker1 method, PARAFAC2 method, LSA with term alignments, LMSA, LMSA with term alignments; Constrained clustering with k-means type algorithms.

UNIT III CONTENT BASED CLASSIFICATION 9

Classification algorithms- Document Classification, Content-based spam email classification, Utilizing nonnegative matrix factorization for email classification problems.

UNIT IV ANOMALY AND TREND DETECTION 9

Text visualization techniques: Visualization in text analysis, Tag clouds, tag clouds, authorship and change tracking, Data Exploration and the search for noval patterns, sentiment tracking, visual analytics and Future Lens, scenario discovery. Adaptive threshold setting for novelty mining: Introduction, adaptive threshold for anomaly detection, Experimental study.

UNIT V EVENTS AND TRENDS IN TEXT STREAMS 9

Introduction, Text streams, Feature extraction and data reduction, Event detection, Trend detection, Event and trend descriptions. Embedding semantics in LDA topic models: Introduction, vector space modeling, latent semantic analysis, probabilistic latent semantic analysis, Latent Dirichlet allocation, embedding external semantics from Wikipedia, data-driven semantic embedding.

TOTAL=45Hrs

TEXT BOOKS:

1. Michael W. Berry & Jacob Kogan,"Text Mining Applications and Theory", Wiley publications, 2010.
2. Aggarwal, Charu C., and ChengXiangZhai, eds., “Mining text data”, Springer Science & Business Media, 2012.

REFERENCES

1. Miner, Gary, et al., “Practical text mining and statistical analysis for non-structured text data applications”, Academic Press, 2012.
2. Srivastava, Ashok N., and MehranSahami, “Text mining: Classification, clustering, and applications”, Chapman and Hall/CRC, 2009.
3. Buitelaar, Paul, Philipp Cimiano, and Bernardo Magnini, eds., “Ontology learning from text: methods, evaluation and applications”, Vol. 123. IOS press, 2005.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**1**									**3**	**3**
CO2	**3**	**2**	**1**									**3**	**2**
CO3	**3**	**3**	**2**									**2**	**3**
CO4	**3**	**3**	**2**									**2**	**1**
Average	**3**	**2.75**	**1.5**									**2.5**	**2.25**
Level of correlation	**3**	**3**	**2**									**3**	**3**

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

Minor Degree in web Designing

Sri Venkateswara College of Engineering and Technology
(Autonomous)

II B.Tech II Semester-CSE

L	T	P	C
3	1	-	4

20ACS78 HTML & CSS

Course Outcomes:

After Completion of the course the student will be able to

1. Analyze and apply the role of languages HTML, DHTML, database access in the working of the webband web applications.
2. Use internal and external cascading style sheets (CSS) to consistently format elements on a page or group of pages.
3. Ability to work with links exploring the URL and ability creating Hyperlinks, linking to mail system.
4. Create a table, adding title to a column, working with images, colors and canvas build dynamicweb pages using HTML and CSS

UNIT-I **8 hrs**

INTRODUCTION

Internet and Web, HTML, Javascript, CSS,XML,XHTML, Ajax,Php,HTML5 and its Elements, HTML5-Next generation web development, Structuring an HTML Document, creating and saving an HTML Documents, Validating an HTML Documents, Viewing an HTML Documents.

UNIT II **9 hrs**

Understanding Elements, Describing Data Types, working with root and metadata elements, working with script and no script elements, working with section elements, working with header and footer elements, working with Headings , working with charter entities, Horizontal rules, line breaks, paragraphs ,working with Text: formatting Text with HTML Documents, Mark elements, strong elements, code, small elements.

UNIT III **8 hrs**

Displaying Plain text, bold text, Italic text, small text, subscripted text, Inserted text, Deleted text, variables and arguments using VAR elements, Organizing Text in HTML: arranging Text, Displaying List, Working with links: Exploring the Hyperlinks, Exploring the URL, Exploring the newsgroup and mail system, Link relation, creating Hyperlinks, linking to mail system.

UNIT IV **8 hrs**

Creating tables : Understand tables, Describing the Table Elements, creating simple table, adding title to a column, adding caption to a table, specifying properties of the column, spanning rows and columns, working with images, colors and canvas : inserting images in a web pages, Exploring colors .

UNIT V **7 hrs**

Evolution of CSS, syntax of CSS, Exploring CSS sectors, inserting CSS sectors in HTML Doc, Exploring background of webpage, Exploring color properties ,understanding fonts, exploring font properties, web fonts.

Text Books:

1.DT Editorial Service ," HTML 5 Black Book, Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and jQuery, 2ed 2016 , Dream Tech Press .

Reference books:

1. M. Deitel, P.J. Deitel, A. B. Goldberg ,Internet& World Wide Web How to H program, 3 rd Edition, Pearson Education, 2004.

2. Ellie Quigley, Marko Gargenta,"PHP and MySQL" , Prentice Hall(Pearson),2006

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**2**										**3**	**2**
CO2	**2**	**2**	**1**										**3**	**1**
CO3	**2**	**1**	**-**										**3**	**1**
CO4	**3**	**1**	**1**										**3**	**2**
Average	**2.5**	**1.75**	**1.33**										**3**	**1.5**
Level of correlation	**3**	**2**	**1**										**3**	**2**

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

Minor Degree in web Designing

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester CSE

L	T	P	C
3	1	-	4

20ACS79 **WEB APPLICATION DEVELOPMENT WITH PHP**

Course Outcomes:

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

1. Develop simple program using control statement.
2. Perform operations based on arrays and strings.
3. Develop programs by applying object oriented concepts.
4. Design Web pages using form controls.
5. Perform database operations using MYSQL and PHP.

UNIT- I **12 Hrs**

Introduction to PHP: Lexical Structure, Variables, Data types, Expressions and operators, Flow Control Statements, Embedding PHP in Web Pages.

Functions: Calling a Function, Defining a Function, Variable Scope, Function Parameters, Return Values, variable functions, Anonymous Functions.

UNIT-II **12 Hrs**

Arrays: Indexed Versus Associative Arrays, Identifying Elements of an Array, Storing Data in Arrays, Extracting Multiple Values, Multidimensional Arrays, Converting Between Arrays and Variables, Traversing Arrays, Sorting, Acting on Entire Arrays, Using Arrays-Sets, Stacks , Iterator Interface.

Strings: Quoting String Constants, Printing Strings, Accessing Individual Characters, Cleaning Strings, Encoding and Escaping, Comparing Strings, Manipulating and Searching Strings, Regular Expressions.

UNIT-III **12 Hrs**

Objects: Creating an Object, Accessing Properties and Methods, Declaring a Class, Introspection, Serialization.

Graphics: Embedding an Image in a Page, Basic Graphics Concepts, Creating and Drawing Images, Images with Text, Dynamically Generated Buttons, Scaling Images, Color Handling.

PDF : Initializing the Document, Outputting Basic Text Cells, Text Coordinates, Text Attributes,

Page Headers, Footers, and Class Extension, Images and Links, Tables and Data.

UNIT-IV **12 Hrs**

Web Techniques: HTTP Basics, Variables, Server Information, Processing Forms, Form Validation,

Setting Response Headers, Combining Cookies and Sessions, SSL.

XML: Lightning Guide to XML , Generating XML, Parsing XML , Parsing XML with DOM , Parsing XML with SimpleXML, Transforming XML with XSLT.

Security: Filter Input, Cross-Site Scripting- SQL Injection, Escape Output-Filenames, Session Fixation, File Uploads, File Access.

UNIT-V **12 Hrs**

Databases : Using PHP to Access a Database, Relational Databases and SQL, PHP Data Objects, MySQLi Object Interface, Retrieving Data for Display, SQLite, Direct File-Level Manipulation, MongoDB, Retrieving Data, Inserting More Complex Data.

Web Services : REST Clients, Responses, Retrieving Resources, Updating Resources, Creating Resources, Deleting Resources, XML-RPC:- Servers, Clients.

TEXT BOOK:

3. Programming PHP, Rasmus Lerdorf, Kevin.T and Peter M., 2013, 3rd Edition, O'Reilly, USA.

REFERENCE BOOKS:

1. Luke Welling, Laura Thomson, "PHP and MySQL Web Development", 5th Edition, PearsonEducation, 2016. ISBN: 978-9332582736.
2. PHP and MySQL, PHP and MySQL in easy steps, 2nd edition, 2017, ISBN: 9789386551405.
3. The Complete Reference PHP, Holzner, Steven, Indian Edition 2017.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	2												1	-
C02	2												1	-
C03	3	3	3	1	1								3	1
C04	3	1	2										2	1
C05	3	1	1	-	1								3	1
Average	2.6	1.33	2	1	1								2	1
Level of correlation	3	1	2	1	1								2	1

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

Minor Degree in web Designing

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

III B.Tech II Semester CSE

L	T	P	C
3	1	-	4

20ACS80 **DJANGO FRAMEWORK**

Course Outcomes:

After completion of the course the student will able to do

1. Understand the basics of Django and dynamic web pages.
2. Understand the concepts of how to interact with databases with administration site.
3. Understand the fundamentals of Views URLs and Templates.
4. Understand the Non-HTML content with sessions, users and registration.
5. Understand the fundamentals of caching and middleware.

UNIT I - Introduction to Django 9

What is web framework – The MVC design pattern – Django's history – Getting started with Django – Setting up a database – Staring a project – The basics of dynamic webpages - Mapping URL to views – How Django processes a request – URLconfs and loose coupling – 404 Errors – Dynamic URLs – Django's pretty error pages – The Django template system.

UNIT II - Interacting with Databases, Django Administration Site and Form Processing 9

The Dumb way to do database queries in views – The MTV development pattern – Configuring the databases – Defining models in python – First model – Installing the model – Basic data access – Adding model string representation – Inserting and updating data – Selecting objects – Deleting objects – Making changes to database schema – The Django administration site – Activating the admin interface – Using the admin interface – Customizing the admin interface – Customizing the admin index page – Form processing – Search – The perfect form – creating a feedback form – processing the submission – custom validation rules – Creating forms from models

UNIT III – Advanced Views and URLconfs, Generic Views and Extending the Template Engine 9

URLconf tricks – Including other URLconfs – Generic Views – Using generic views – Generic view of objects – Extending generic views – Extending the Template Engine – Template language review – RequestContext and Context Processors – Inside template loading – Extending the template system – Writing custom template loaders – Using the built-in template reference – Configuring the template system in standalone mode.

UNIT IV – Generating Non-HTML Content, Sessions, Users and Registration

9

Generating Non-HTML Content – Producing CSV – Generating PDFs – Other possibilities – The syndication feed framework – The sitemap framework – Sessions, Users and Registration – Cookies – Django's session framework – Users and authentication – Permissions, Groups, Messages and Profiles

UNIT V – Caching, Other Contributed Sub frameworks and Middleware

9

Caching – Setting up the cache – The Per-Site cache – The Per-View cache – The low level cache API – Upstream caches – The Django's standard library – Sites – Flat pages – Redirects - CSRF protection – Humanizing data – Markup filters – Middleware – What is middleware – Middleware installation – Middleware methods – Built-in middleware.

TOTAL: 45 PERIODS

TEXT BOOK:

3. Adrian Holovaty, Jacob K. Moss, "Django The Definitive Guide to Django: Web Development Done ", www.djangobook.com

REFERENCE BOOKS:

2. Daniel Rubio, "Beginning Django Application Development and Deployment with Python", Apress.
3. Beau Curtin, "Django Cookbook Web Development with Django Step by Step Guide", 2nd Edition Mapping:

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2												1	1
CO2	2		1										1	
CO3	2												2	
CO4	2												1	1
CO5	2												2	1
Average	2		1										1.4	1
Level of correlation	2		1										1	1

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

Minor Degree in web Designing

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)
III B.Tech II Semester CSE

L	T	P	C
3	1	-	4

20ACS81 **FULL STACK REACT**

Course Outcomes:

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

1. Develop industry-ready Single Page Web Application and APIs using React.
2. Create a full E-Commerce App with React.
3. Apply intermediate and advanced web development practices.

UNIT- I 12 Hrs

First React Web Application: Prepare the app, Building Product, Rendering multiple products, Propagating the event, Binding custom component methods, Updating state and immutability, Babel plugins and presets, Refactoring ProductList.

Components: Breaking the app into components, Build a static version of the app, Determine what should be stateful, Determine in which component each piece of state should live, Hard-code initial states, Add inverse data flow.

UNIT-II 12 Hrs

Components & Servers: The Server API, Playing with the API.

JSX and the Virtual DOM: React Uses a Virtual DOM, ReactElement, JSX.

Advanced Component Configuration with props, state, and children: ReactComponent, PropTypes, context, Stateful components, Stateless components, talking to Children Components with props.children.

UNIT-III 12 Hrs

Forms: Form Modules, Webpack basics, Using Create React App with an API server

Using Webpack with Create React App: JavaScript modules, Exploring Create React App,

Unit Testing: Using Jest, Testing strategies for React applications, Testing a basic React component with Enzyme, Writing tests for the food lookup app.

Routing: Building the components of react-router, Dynamic routing with React Router, Supporting authenticated routes.

UNIT-IV 12 Hrs

Intro to Flux and Redux: Flux implementations, Redux, Building a counter, Building the store, Building the reducer(), Subscribing to the store , Connecting Redux to React.

Intermediate Redux: Using createStore() from the redux library, Representing messages as objects in state, Introducing threads, Breaking up the reducer function.

UNIT-V 12 Hrs

Using Presentational and Container Components with Redux: Presentational and container components, generating containers with react-redux, Action creators.

Using GraphQL: GraphQL Benefits, Complex Types, Exploring a Graph.

TEXT BOOK:

4. Fullstack React: The Complete Guide to ReactJS and Friends, Ari Lerner, Anthony Accomazzo, Nate Murray, Clay Allsopp, 2017.

REFERENCE BOOKS:

1. Mastering Full-Stack React Web Development, Tomasz Dyl, Kamil Przeorski, Maciej Czarnecki, Packt Publishing Ltd, ISBN: 978-9332582736, 2017.
2. Learning React: Functional Web Development with React and Redux, 1st Edition, Alex Banks, Eve Porcello, 2017, O'Reilly, USA.
3. The Road to React, Robin Wieruch: Publisher: Robin Wieruch, 2017: ISBN: 172004399X, 9781720043997.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	2	2										3	2
C02	3	3	3	2									3	3
C03	3	2	2	1									3	1
Average	3	2.33	2.33	1.5									3	2
Level of correlation	3	3	3	2									3	2

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

Minor Degree in web Designing

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester CSE

L	T	P	C
3	1	-	4

20ACS82 **FULL STACK DEVELOPMENT USING Node.js, Type script**

Course Outcomes:

After completion of the course the student will able to do

1. Understand the basics Node.js and getting started with Node.js
2. Understand the concepts of asvnc.js and callback features
3. Understand the fundamentals of Typescript
4. Understand the how the typescript runs in a browser and on a server.

UNIT I – Getting Started with Node.js 9 hrs

Hello world HTTP server – Hello world command line – Installing and running Node.js – Running a Node program – Hello world with express – Hello world basic routing – How to create key and certificate – TLS socket server – TLS socket client – Arduino communication with Node.Js

UNIT II - async.js 9 hrs

Syntax **–** Call async.parallel() with an object – Resolving multiple values - Call async.series() with an object – Async/Await – Introduction – Examples – Asynchronous programming – Introduction – Syntax – Callback function in JavaScript – Callback functions in Node.js – Try catch – Working possibilities.

UNIT III – Advanced Concepts in Node.js 9 hrs

Auto reload on changes – Avoid call back hell – Bluebird promises – Callback to promise – Cassandra Integration – CLI – Client server communication – Cluster module – Connect to Mongodb

UNIT IV – Typescript Language Features 9 hrs

Javas script is valid Typescript – Types – Operators – Functions – Interfaces – Classes – Generics – Code organization – The type system.

UNIT V – Advanced Concepts in Typescript 9 hrs

Object orientation in Typescript – Understanding the runtime – Running Typescript in a browser – Running Typescript on server – Exceptions, Memory and Performance – Using java script libraries – Automated testing.

TOTAL: 45 PERIODS

TEXT BOOKS:

4. Free Ebook, “Learning Node.js”, #node.js
5. Steve Fenton " Pro TypeScript Application-Scale JavaScript Development", Second Edition, Apress.

REFERENCE BOOK:

4. Krishna Rungta, “Learn NodeJS in 1 Day”

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**2**	**-**	**-**	-	-	**-**	**-**	-	**-**	**-**	**-**	-	**2**	**2**
CO2	**2**	**-**	**-**	-	-	**-**	**-**	-	**-**	**-**	**-**	-	**2**	**1**
CO3	**2**	**-**	**-**	-	-	**-**	**-**	-	**-**	**-**	**-**	-	**2**	**1**
CO4	**2**	**-**	**-**	-	-	**-**	**-**	-	**-**	**-**	**-**	-	**2**	**1**
Average	**2**												**2**	**1.25**
Level of correlation	**2**												**2**	**1**

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

Minor Degree in Cyber Security

Sri Venkateswara College of Engineering and Technology
(Autonomous)

II B.Tech II Semester-CSE

L	T	P	C
3	1	-	4

20ACS83 INFORMATION THEORY FOR CYBER SECURITY

Course Outcomes:

After Completion of the course the student will be able to

1. Introduce the principles and applications of information theory.
2. Justify how information is measured in terms of probability and entropy.
3. Learn coding schemes, including error correcting codes.

UNIT I **7 hrs**

Shannon's foundation of Information theory, Random variables, Probability distribution factors, Uncertainty/entropy information measures, Leakage, Quantifying Leakage and Partitions, Lower bounds on key size: secrecy, authentication and secret sharing. Provable security, computationally-secure, symmetric cipher.

UNIT II **7 hrs**

Secrecy, Authentication, Secret sharing, Optimistic results on perfect secrecy, Secret key agreement, Unconditional Security, Quantum Cryptography, Randomized Ciphers, Types of codes: block codes, Hamming and Lee metrics, description of linear block codes, parity check Codes, cyclic code, Masking techniques.

UNIT III **8 hrs**

Information-theoretic security and cryptograph, basic introduction to Diffie-Hellman, AES, and side-channel attacks.

UNIT IV **7 hrs**

Secrecy metrics: strong, weak, semantic security, partial secrecy, Secure source coding: rate-distortion theory for secrecy systems, side information at receivers, Differential privacy, Distributed channel synthesis.

UNIT V

7 hrs

Digital and network forensics, Public Key Infrastructure, Light weight cryptography, Elliptic Curve Cryptography and applications.

Text Books/References:

1. Information Theory and Coding, Muralidhar Kulkarni, K S Shivaprakasha, John Wiley & Sons.
2. Communication Systems: Analog and digital, Singh and Sapre, Tata McGraw Hill.
3. Fundamentals in information theory and coding, Monica Borda, Springer.
4. Information Theory, Coding and Cryptography R Bose.
5. Information Security & Cyber Laws, Gupta & Gupta, Khanna Publishing House.
6. Multi-media System Design, Prabhat K Andleigh and Kiran Thakrar.

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

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

Minor Degree in Cyber Security

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester CSE

		L	T	P	C
		3	1	-	4
20ACS84	**STEGANOGRAPHY AND DIGITAL WATERMARKING**				

COURSE OUTCOMES

Upon 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 Nonadaptive Algorithms- Active and Malicious Attackers- 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 - Merging the Watermark and the Cover - Optimization of the Watermark Receiver Extensions from Still Images 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, Geometric Transformation. 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 and Terminology - Looking for Signatures-Detecting Hidden Information Extracting Hidden Information - Disabling Hidden Information- The Statistical Properties of Images- The Visual Steganalytic System- IQM-Based Steganalytic System- Learning Strategies- The Frequency-Domain Steganalytic System.

UNIT V - Robustness of Copyright Marking Systems 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 of Copyright Laws on the Internet.

Text Books

1. Stefan Katzenbeisser, Fabien, A.P. Petitcolas., "Information Hiding Techniques for Steganography and Digital Watermarking", Artech House.
2. Frank Y. Shih., "Digital Watermarking and Steganography: Fundamentals and Techniques", CRC Press.(2nd edition)

Reference Books

1. Neil F. Johnson; Zoran Duric; Sushil Jajodia, "Information Hiding: Steganography and Watermarking - Attacks and Countermeasures", Springer.
2. Gregory Kipper, "Investigator's Guide to Steganography", Auerbach Publications.

CO- PO Mapping

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

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

Minor Degree in Cyber Security

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester CSE

	L	T	P	C
	3	1	-	4

20ACS85 Security Policy and Governance

Course Outcomes:

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

1. Understand the basic concepts of Policy Development and Guidelines.
2. Learn about the Information classification and Information Governance.
3. Understand the concept of information Classification.

Unit I- 9 hrs

Information Governance Concepts, Definitions, And Principles

Big Data Impact - Defining Information Governance - Failures in Information Governance- Form IG Policies, Then Apply Technology for Enforcement- Data Governance - Data Governance Strategy Tips - IT Governance - IT Governance Frameworks - Impact of a Successful IG Program- InformationGovernancePrinciples - Accountability is Key - Generally Accepted Recordkeeping Principles - Assessment and Improvement Roadmap - Information Security Principles - Privacy Principles - Who Should Determine IG Policies.

UNIT II-POLICY DEVELOPMENT 9 hrs

Policy Definitions- Policy, Standards, Guidelines, and Procedures: Definitions and Examples - Policy Key Elements-Policy Format and Basic Policy Components-Policy Content Considerations Program Policy Examples.Topic-Specific Policy Examples - Business Goals versus Security Goals - Computer Security Objectives - Mission Statement Format - Allocation of Information Security Responsibilities (ISO 17799–4.1.3) - Mission Statement Examples - Support for the Mission Statement– standards.

UNIT III- INFORMATION CLASSIFICATION 8 hrs

Introduction - Why Classify Information- What Is Information Classification? -Establish a Team - Developing the Policy -Resist the Urge to Add Categories -What Constitutes Confidential Information- Classification Examples-Declassification or Reclassification of Information- Information Classification Methodology-Authorization for Access - Information Asset Risk Planning and Management - The Information Risk Planning Process - Create a Risk Profile - Information Risk Planning and Management Summary – IG reference model - Information Security Management Metrics.

UNIT IV- THE INFORMATION RISK MANAGEMENT PROGRAMME 9 hrs

The Information Risk Management - Risk Identification - Threat and Vulnerability Assessment - Risk Analysis and Risk Evaluation – Risk Treatment – Risk Reporting and Presentation.

UNIT V-INFORMATION GOVERNANCE FOR DELIVERY PLATFORMS 8 hrs

Information Governance for E-Mailand Instant Messaging - Information Governance for SocialMedia - Information Governance for Mobile Devices - Information Governance for Cloud Computing–Leveraging and Governing Emerging Technologies.

Text Books

1. Information Governance: Concepts, Strategies, And Best Practices, Second Edition, Wiley Publications by Robert F. Smallwood
2. Information security Policies,Standards and procedures by Thomas R.Peltier CRC press
3. Information Security Governance: A Practical Developmentand Implementation Approach, Wiley Publications,2009 by KragBrotby
4. Information Risk Management: A Practitioner's Guide, Second edition, by David Sutton.

Reference Book

1. Information Security Governance, Springer, by S. H. Von Solms and R. Von Solms
2. IT Governance and Information Security: Guides, Standards and Frameworks, CRC Press, by Yassine Maleh, AbdelkebirSahid,MamounAlazab, Mustapha Belaissaoui.

CO- PO Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	3	2	1	-	-	-	-	-	-	-	-	-	3	1
CO2	3	2	-	-	-	-	-	-	-	-	-	-	2	1
CO3	3	3	3	1	-	-	-	-	-	-	-	-	3	2
Average	3	2.33	2										2.66	1.33
Level of correlation	3	3	2	1									3	1

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

Minor Degree in Cyber Security

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)
III B.Tech II Semester CSE

L	T	P	C
3	1	-	4

20ACS86 **Security Assessment and Risk Analysis**

Course Outcomes:

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

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

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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	3	3	1	-	-	-	-	-	-	-	-	2	2
C02	3	2	2	2	-	-	-	-	-	-	-	-	2	1
C03	3	3	1	-	1	-	-	-	-	-	-	-	2	2
Average	3	2.33	2	1.5		-	-	-	-	-	-	-	2	1.66
Level of correlation	3	3	2	2	1								2	2

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

Minor Degree in Cyber Security

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester CSE

	L	T	P	C
	3	1	-	4

20ACS87 Database Security and Access Control

Course Outcomes:

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

1. Gain complete knowledge on database security problems and make a study on level 1 security models.
2. Understand the concepts of User Identification/Authentication and trusted computer systems in level 2 security models.
3. Classify the different design issues related to Security Software and Secure Operating System, Secure DBMS and Security Packages,Statistical Database Protection & Intrusion Detection Systems
4. Understand the level 1 models for protection of new generation database systems specially for the protection of Object Oriented System.
5. Analyze the Orion Model, ajodia and Kogan's Model under the level 2 models for databasesystems protection.

UNIT- I:

Introduction: Introduction to Databases Security Problems in Databases Security Controls Conclusions Security Models -1: Introduction Access Matrix Model Take-Grant Model Acten Model PN Model Hartson and Hsiao's Model Fernandez's Model Bussolati and Martella's Model for Distributed databases

UNIT-II:

Security Models -2: Bell and LaPadula's Model Biba's Model Dion's Model Sea View Model Jajodia and Sandhu's Model The Lattice Model for the Flow Control conclusion Security Mechanisms: Introduction User Identification/Authentication Memory Protection Resource Protection Control Flow Mechanisms Isolation Security Functionalities in Some Operating Systems Trusted Computer System Evaluation Criteria

UNIT- III:

Security Software Design: Introduction A Methodological Approach to Security Software Design Secure Operating System Design Secure DBMS Design Security Packages Database Security Design Statistical Database Protection & Intrusion Detection Systems: Introduction Statistics Concepts and Definitions Types of Attacks Inference Controls evaluation Criteria for Control Comparison. Introduction IDES System RETISS System ASES System Discovery

UNIT- IV:

Models for the Protection of New Generation Database Systems -1: Introduction A Modelfor the Protection of Frame Based Systems A Model for the Protection of Object-OrientedSystems SORION Model for the Protection of Object-Oriented Databases

UNIT-V:

Models for the Protection of New Generation Database Systems -2: A Model for the Protection of New Generation Database Systems: the Orion Model ajodia and Kogan's Model A Model for the Protection of Active Databases Conclusions

TEXT BOOK:

1. Database Security by Castano Pearson Edition (lie) Database Security and Auditing: Protecting Data Integrity and Accessibility, 1st Edition, Hassan Afyouni, THOMSON Edition.

REFERENCE BOOK:

1. Database security by alfred basta, melissazgola, CENGAGE learning.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	2	2	1	-	-	-	-	-	-	-	-	2	1
C02	3	2	1	-	-	-	-	-	-	-	-	-	2	1
C03	3	3	2	1	-	-	-	-	-	-	-	-	3	1
C04	3	1	1	-	-	-	-	-	-	-	-	-	2	-
C05	3	3	1	1	-	-	-	-	-	-	-	-	2	-
Average	3	2.2	1.4	1									2.2	1
Level of correlation	3	2	1	1									2	3

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

General Minor

Sri Venkateswara College of Engineering and Technology
(Autonomous)

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

L	T	P	C
3	-	2	4

20ACS88 OPERATING SYSTEMS AND SYSTEM PROGRAMMING

Course Outcomes:

After Completion of the course the student will be able to

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

UNIT I

INTRODUCTION TO SYSTEMS PROGRAMMING

Introduction: Components of System Software, Language Processing Activities, And Fundamentals of Language Processing Assemblers: Elements of Assembly Language Programming

A simple Assembly Scheme, Pass structure of Assemblers, Design of Two Pass Assembler, Single pass assembler Macro Processor: Macro Definition and call, Macro Expansion, Nested Macro Calls and definition, Advanced Macro Facilities, Design of Macro Processor

UNIT II

INTRODUCTION TO OS AND SCHEDULING

OS Design issues - Structuring methods (monolithic, layered, modular, micro-kernel models) Overview of computer operating systems, operating systems structures: operating system services and systems calls, system programs, operating system structure Process concepts, Cooperating processes, Inter process communication. CPU Scheduling: Basic concepts, Scheduling criteria, Algorithms, and their evaluation.

UNIT III

PROCESS SYNCHRONIZATION & DEADLOCK

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

UNIT IV

MEMORY MANAGEMENT STRATEGIES

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

UNIT V

FILE SYSTEM INTERFACE

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

LIST OF EXPERIMENTS

1. Implement the various process scheduling mechanisms such as FCFS, SJF, Priority, round – robin.
2. Implement the solution for dining philosopher's problem.
3. Implement banker's algorithm.
4. Implement the first fit; best fit and worst fit file allocation strategy.
5. Write a C program to simulate page replacement algorithms a) FIFO b) LRU
6. Write a C program to simulate disk scheduling algorithm a)FIFO b)SCAN c)CSCAN

Text Books:

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

Reference Books:

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

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

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

MINOR DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester CSE

L	T	P	C
3	-	2	4

20ACS89 **DATABASE MANAGEMENT SYSTEMS**
(Minor)

Outcomes:

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

1. Write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
2. Draw Entity-Relationship diagrams to represent simple database application scenarios.
3. Describe transaction processing and concurrency control concepts.
4. Understand database-system architectures, parallel and distributed storage to develop advanced application.

UNIT I 9Hrs

Introduction: Purpose of Database Systems, View of Data, Database and Application Architecture, Structure of Relational Databases, Database Schema, Keys. Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions. Join Expressions, Views, Transactions, Integrity Constraints, SQL Data Types and Schemas, Index Definition in SQL, Authorization.

UNIT-II 8Hrs

Database Design Using the E-R Model: Overview of the Design Process, The Entity-Relationship Model, Complex Attributes, Mapping Cardinalities, Primary Key, Removing Redundant Attributes in Entity sets.

Relational Database Design: Features of Good Relational Designs, Decomposition Using Functional, Dependencies, Normal Forms, Functional-Dependency Theory, Algorithms for Decomposition Using Functional Dependencies, Decomposition Using Multivalued Dependencies, Atomic Domains and First Normal Form, Database-Design Process, Modeling Temporal Data.

UNIT III 9Hrs

Transactions: Transaction Concept, A Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity, Transaction Isolation Levels.

Concurrency Control: Lock-Based Protocols, Deadlock Handling, Multiple Granularity, Timestamp-Based Protocols.

Recovery System: Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Non-Volatile.

UNIT IV 8Hrs

Storage and File Structure: Overview of Physical Storage, Media, Magnetic Disk and Flash Storage, RAID, Tertiary Storage File Organization, Organization of Records in Files, Data-Dictionary Storage, Database Buffer.

Indexing: Basic Concepts, Ordered Indices, B+-Tree Index Files, B+-Tree Extensions, Hash Indices, Multiple-Key Access.

Query Processing: Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation.

UNIT V 8Hrs

Advanced Application Development: Performance Tuning, Performance Benchmarks.

Database-System Architectures: Overview, Centralized Database Systems, Server System Architectures, Parallel Systems, Distributed Systems, Transaction Processing in Parallel and Distributed Systems, Cloud-Based Services.

Parallel and Distributed Storage: Overview, Data Partitioning, Dealing with Skew in Partitioning, Replication, Parallel Indexing, Distributed File Systems, Parallel Key-Value Stores.

LIST OF EXPERIMENTS

1. Creation, altering and dropping of tables and inserting rows into a table (use constraintswhile creating

tables) examples using SELECT command.

2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOT EXISTS, UNION,

INTERSECT, EXCEPT operators.. Example:, Select the roll number and name of thestudent who

secured fourth rank in the class.

3. Using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY,HAVING ,Creation and dropping of Views.
4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
5. i) Creation of simple PL/SQL program which includes declaration section, executable section and exception –handling section (Ex. Student marks can be selected from the tableand printed for those who secured first class and an exception can be raised if no records were found)

i) Implement COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

6. Develop a program that includes the features NESTED IF, CASE and CASE expression.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops usingERROR Handling, BUILT –IN Exceptions, USE defined Exceptions.
8. Program development using the creation of stored functions, invoke functions in SQLStatements and write complex functions.

TEXT BOOKS:

1. Raghurama Krishnan, Johannes Gehrke, "Data base Management Systems", TATA McGraw,Hill 3rd Edition,2007.
2. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", Fifth Edition, Tata McGraw Hill, 2006.
3. Ivan Bayross, "SQL, PL/SQL programming language of Oracle", BPB Publications 4th edition, 2010.

REFERENCE BOOKS:

1. Peter Rob, Carlos Coronel, Database Systems Design Implementation andManagement, 7th edition, 2009.
2. Scott Urman, Michael McLaughlin, Ron Hardman, "Oracle database 10g PL/SQL programming ",6th edition, Tata McGraw Hill,2010
3. S.K.Singh, "Database Systems Concepts, Design and Applications", First edition, Pearson Education, 2006.
4. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", FourthEdition, Pearson / Addision wesley, 2007.
5. Ashutosh Kumar Dubey," Database Management Concepts", 3rd edition,S.K.Katari& Sons,2008.

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

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

MINOR DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester CSE

L	T	P	C
3	-	2	4

20ACS90

R PROGRAMMING

Course Outcomes:

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

1. Apply the basics of R programming and its functions
2. Apply the package concepts in R
3. Explore data analysis with objects and computation
4. Implement graphics with R.

UNIT- I (8)

Introduction to R: Starting R – Installation- Data objects in R – Data Import and Export – Data Manipulation – Computing with data – Organizing an analysis

UNIT-II (8)

Programing with R: Introduction, Data Structures, Managing R Session, Language Basics, Subscripting and subseting, Vectoized computations, Replacement functions, Functional Programming, Writitng functions, Flow control, Exception handling.

Object-oriented programming in R: Introduction, The basics of OOP, S3 OOP, s4 OOP, Documentation, Debugging

UNIT-III (8)

Working with Data: Input and output in R: Introduction, Basic file handling, Connection, File input and output, sources and sink. Character data introduction: Built-in capabilities, Regular expressions, Prefixes, suffixes and substrings, Matching patterns.

UNIT-IV (8)

Data Manipulation: Reading Data, Examples of Reading and formatting datasets, Manipulating data with dplyr: dplyr functions, Tidying data with tidlyr.

UNIT-V (8)

R Packages and Graphic: Creating a R packages, Package Names, The structure of an R package, Namespace, Roxygen, Adding data to your package, Building an R Package, Base R Graphics, The grammar of graphics and the ggplot2 packages, Figures with multiple plots.

List of Experiments

1. Implementation of vector data objects operations
2. Implementation of matrix, array and factors and perform va in R
3. Implementation and use of data frames in R .
4. Create Sample (Dummy) Data in R and perform data manipulation with R
5. Study and implementation of various control structures in R
6. Data Manipulation with dplyr package
7. Data Manipulation with data.table package
8. Study and implementation of Data Visualization with ggplot2
9. Study and implementation data transpose operations in R

TEXT BOOK:

1. Hothorn, Torsten, and Brian S. Everitt. A handbook of statistical analyses using R. Chapman and Hall/CRC, 2006.
2. Gentleman, Robert. R programming for bioinformatics. Chapman and Hall/CRC, 2008.
3. Mailund, Thomas. Beginning Data Science in R. California: Apress, 2017.

REFERENCE BOOKS:

1. Nicholas J. Horton, Ken Kleinman," Using R and RStudio for Data Management, Statistical Analysis, and Graphics" , CRC Press, Second edition, 2015
2. Eric D. Kolaczyk, "Statistical Analysis of Network Data with R", Springer, 2014
3. John Maindonald, W. John Braun,"Data Analysis and Graphics 193 Using R: An Example-Based Approach", University Press, Cambridge, Third edition, 2010.
4. John M. Quick," Statistical Analysis with R", Packt Publishing , 2010.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	2	-	-	-	-	-	-	-	-	-	-	3	2
C02	3	3	2	1	-	-	-	-	-	-	-	-	3	2
C03	3	2	1	2	1	-	-	-	-	-	-	-	3	2
C04	3	2	2	1	1	-	-	-	-	-	-	-	3	2
Average	3	2.2	1.66	1.33	1								3	2
Level of correlation	3	2	2	1	1								3	2

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

MINOR DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech II Semester CSE

L	T	P	C
3	-	2	4

20ACS91 **JAVA PROGRAMMING(Minor)**

Course Outcomes:

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

1. Apply object-oriented concepts to various programming problems
2. Apply error handling techniques.
3. Develop JAVA application using applets.
4. Develop JAVA application to adopt collections and packages.

UNIT- I (8)

Object Oriented programming: Two paradigm, abstraction, The three oops principles. JAVA BASICS: Two control statements, Using Blocks of code, Lexical Issues. Data types, Variables and Arrays, Operators, Control statements.

UNIT-II (8)

OOPs classes and Objects: Introducing classes, Class fundamentals, Declaring objects , Assigning object reference variables, Introducing methods, Constructors, The this keyword, Inheritance, Inheritance basics, using super, creating multilevel hierarchy, Method overriding,

UNIT-III (8)

Packages and Interfaces: Packages: Defining package, Finding Package and CLASSPATH, Packages and member access, importing packages, Interfaces: Definition an Interface, implementing interfaces, Nested Interfaces, applying interfaces, variables in interface and extending interfaces, Use static methods in an interface.

UNIT-IV (8)

Exception Handling: Exception handling fundamentals, exception types, uncaught exceptions, usage of try, catch, throw, throws and finally, built- in exceptions, creating own exception sub classes. MULTI THREADING: The java thread model, the main thread, creating threads, Thread priorities, synchronization, inter thread communication.

UNIT-V **(8)**

Introducing the AWT: Working with Windows, Graphics, and Text: AWT classes, Window Fundamentals, working with frame windows, Introducing graphics: Drawing Lines, Rectangles, Arcs,Ploygon,Working with color, Working with Fonts, AWT control fundamentals, Labels, Using buttons, Applying check boxes, Using Lists, Using a TextArea.

List of Experiments

1. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
2. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
3. Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use String Tokenizer class of java.util)
4. Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
5. Write a Java program that displays the number of characters, lines and words in a text file
6. Write a Java program for sorting a given list of names in ascending order. c) Write a Java program to make frequency count of words in a given text.
7. Develop an applet that displays a simple message
8. Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named ―Compute is clicked.

TEXT BOOK:

Herbert schildt, “The complete reference JAVA”, 12th edition, Tata Mcgraw Hill, New Delhi, 2021.

REFERENCE BOOKS:

1. Simon Kendal “Object Oriented Programming Using JAVA”, 2010.
2. Cosmina, Iuliana. Java for Absolute Beginners: Learn to Program the Fundamentals the Java 9+ Way. Apress, 2018.
3. Liang, Y. Daniel. Introduction to Java programming and data structures. Pearson Education, 2018.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	3	3	1	-	-	-	-	-	-	-	-	3	2
C02	3	2	2	1	-	-	-	-	-	-	-	-	3	2
C03	3	3	3	2	1	-	-	-	-	-	-	-	3	2
C04	3	3	3	1	1	-	-	-	-	-	-	-	3	2
Average	3	2.75	2.75	1.25	1								3	2
Level of correlation	3	3	3	1	1								3	2

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

MINOR DEGREE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester CSE

L	T	P	C
3	-	2	4

20ACS92 **App Development Using Android(Minor)**

COURSE OUTCOMES

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

1. Describe the basics Concept of Android Application
2. Understand different Activities, Fragments. Intents used for development of Android Application.
3. Analyze the User interface Components for Android Application
4. Designing User Interface With Views for Android Application
5. Applying Data Persistence with Android Applicaiton

UNIT I

Getting Started With Android Programming- Android Versions-Features of Android-Architecture of Android- -Obtaining the Required Tools-Android Studio-Android SDK-Creating Android Virtual Devices (AVDs)- Your First Android Application.

Using Android Studio For Android Development-Exploring the IDE-Debugging Your Application-Setting Breakpoints-Navigating Paused Code

UNIT II

Activities, Fragments, And Intents-Understanding Activities-Applying Styles and Themes to an Activity-Hiding the Activity Title-Displaying a Dialog Window-Displaying a Progress Dialog-Linking Activities Using Intents-Returning Results from an Intent-Passing Data Using an Intent Object-Fragments-Adding Fragments Dynamically-Life Cycle of a Fragment-Interactions Between Fragments-Understanding the Intent Object-Using Intent Filters-Displaying Notifications**.**

UNIT III

The Android User Interface-Understanding the Components of a Screen-LinearLayout (Horizontal) and Linear Layout (Vertical)-TableLayout-RelativeLayout-FrameLayout -ScrollView-Adapting to Display Orientation-Anchoring Views-Managing Changes to Screen Orientation-Persisting State Information During Changes in Configuration-Detecting Orientation Changes-Controlling the Orientation of the Activity--Utilizing the Action Bar-Adding Action Items to the Action Bar-Creating the User Interface Programmatically-Listening for UI Notifications.

UNIT IV

Designing Your User Interface With Views-Using Basic Views-TextView View-Button, ImageButton, EditText, CheckBox, ToggleButton,RadioButton, and RadioGroup Views-Progress View-AutoCompleteText View-User Piceker Views-Using List Views to Display Long Lists-Understanding Specialized Fragments

Dispaying pictures and menus with views-Using Image views to Display Pictures-Using menus with view using webview-.

UNIT V

Data Persistence-Saving and Loading User Preferences-Persisting Data to Files-Creating and using Databases-Messaging-SMS messaging-Sending SMS messages programmatically-Sending SMS Messages using Intent-Receiving SMS Messages-Cavets and warning-Sending Emails.

Location Based Services-Displaying Maps-Creating the Project-Obtaing the Maps API key-Displaying the map-Displaying Zoom control-Changing Views-Navigating to a specific Location.

TEXT BOOK

1. Begining Android Programming with Android Studio,J.F.Dimarzio, Wiley,2017
2. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)

REFERENCE BOOKS:

1. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd
2. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd
3. Android Application Development All in one for Dummies by Barry Burd, Edition

List of Experiments

Task1- Create a basic app to display the student details as Name, Roll No, Section and Phone No

Task2 -Create an application that takes the name from a text box and shows hello message along with the name entered in text box, when the user clicks the OK button.

Task3-Create a screen that has input boxes for User Name, Password, Address, Gender(radio buttons for male and female), Age (numeric), Date of Birth (Date Picket), State (Spinner) and a Submit button. On clicking the submit button, print all the data below the Submit Button (use any layout)

Task4- Design an android application Send SMS using Intent

Task5-Develop an Android application using controls like Button, Text View, Edit Text for designing a calculator having basic functionality like Addition, Subtraction, Multiplication and Division.

Task6 – Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 secs

Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	**3**												**3**	**2**
CO2	**3**	**3**	**2**										**3**	**2**
CO3	**3**	**3**	**2**										**3**	**2**
CO4	**3**	**3**	**3**	**1**	**1**								**3**	**2**
CO5	**3**	**2**	**2**										**3**	**2**
Average	**3**	**2.75**	**2.25**	**1**	**1**								**3**	**2**
Level of correlation	**3**	**3**	**2**	**1**	**1**								**3**	**2**

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