COURSE STRUCTURE AND DETAILED SYLLABI FOR

FOUR YEARS B. TECH

UNDER ACADEMIC REGULATIONS R20

FOR

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

(For the Batches Admitted from 2020-2021)

&

B. Tech (Lateral Entry Scheme)

(For the Batches Admitted From 2021-2022)

COMPUTER SCIENCE AND ENGINEERING (DATA SCIENCE)

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

Accredited by NBA, New Delhi & NAAC, Bengaluru

Affiliated to JNTUA, Ananthapuram, Recognized by the UGC under Section 12(B) and 12(F) | Approved by AICTE, New Delhi.

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

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FOREWORD

The autonomy conferred Sri Venkateswara College Engineering and technology by JNT University, Ananthapuramu based on performance as well as future commitment and competency to impart quality education. It is a mark of its ability to function independently in accordance with the set norms the monitoring bodies UGC and AICTE. It reflects the confidence of the affiliating University in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus 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 monitoring the quality in education and has gladly accepted theresponsibility of sustaining, the standards and ethics it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education.

As a follow up, statutory bodies like Academic Council and

Boards of Studies are constituted with the guidance of the Governing 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 and Mission of the Institute

Vision

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

Mission

- Providing quality education, student-centered teaching-learning processes and state-of-art infrastructure for professional aspirants hailing from both rural and urban areas.
- Imparting technical and management education to encourage independent thinking, develop strong domain of knowledge, own contemporary skills and positive attitudes towards holistic growth of young minds.
- Evolving Institution into a Center of Excellence andResearch.

Quality policies

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

Vision and Mission of the Department under R20

Regulations

Department Vision:

Evolve as centre of Proficiency in Data Analytics and develop ingenious professional as data analytics and researchers.

Department Mission:

M1: To empower students with innovative and cognitive skills to expertise in the field of Data science.

M2: To Inculcate the seed of knowledge by providing industry conducive environment and excel in data driven world.

M3: To provide an excellent infrastructure, facilities and ambience to nurture the young professionals.

M4: Committed to provide professionals with socio-disciplinary attitude and acquire professional ethics.

Program Educational Objectives (PEOs):

PEO1: Adapt new emerging technologies to analyze complex engineering problems reaching substantiated conclusions in their respective fields.

PEO 2: The graduates will engage in skill enhancement, that would help to work in their own area of interest, individually or in a team.

PEO 3: Demonstrate ownership and responsiveness with strong technical skills to address social and environmental issues.

Program Specific Outcomes (PSOs):

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

PSO 1: Apply learned skills to excel optimized solutions in software development with expertise skills in Data Science, Data Processing and Data Analytics.

PSO 2: Exhibit proficiency in analytics for providing solutions to real world problems in Industry and Research establishments.

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)

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(DATA SCIENCE)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
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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 / weeks 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 students in advance by the concerned Chairman, BOS and displayed in the laboratory during the beginning of the semester.

11.6. Drawing Courses:

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

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

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

  i. Computer Aided Engineering Drawing

11.7 Mandatory Courses:

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

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

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

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

11.9 Project Work:

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

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

11.10 Framework for Mandatory Internships:

11.10.1 Two summer internships each with a minimum of six weeks duration, done at the end of second and third years, respectively are mandatory. The internship can be done by the students at local industries, Govt. Organizations, construction agencies, Industries, Hydel and thermal 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 department and 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.

$$SGPA = \Sigma (C_i \times G_i) / \Sigma C_i$$

where, C_i is the number of credits of the ith subject and G_i 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 hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. 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

(DATA SCIENCE)

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 Counseling	2	0	2	0
3	MC		Orientation to all branches -- career options, tools, etc.	3	0	0	0
4	EC		Orientation on admitted Branch -- corresponding labs, tools and platforms	2	0	3	0
5	ES		Proficiency Modules & Productivity Tools	2	1	2	0
6	MC		Assessment on basic aptitude and mathematical skills	2	0	3	0
7	MC		Remedial Training in Foundation Courses	2	1	2	0
8	MC		Human Values & Professional Ethics	3	0	0	0
9	BS		Communication Skills -- focus on Listening, Speaking, Reading, Writing skills	2	1	2	0
10	ES		Concepts of Programming	2	0	2	0
Total				20	3	22	0

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (DATA SCIENCE)

Course Structure & Scheme of Examination

I B. Tech I Semester-CSE(DS) **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 (DS)

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		20ANSS1/ 20ANCC1	NCC/NSS	0	0	2	-	-	-	-
TOTAL				**19**	**3**	**9**	**19.5**	**420**	**480**	**900**

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

Course Structure & Scheme of Examination

II B.Tech., I Semester **Regulations: R20**

S.NO	Category	Course code	Course Title	Hours per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
1	BS	20AHS10	Numerical Methods	3	1	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	20ACD01	Foundations of Data Science	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	20ACD02	Programming for Data Science 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	20ACD03	Data Analytics with Python	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		20ANSS/ 20ANCC1	NCC/NSS	0	0	2	Non-credit	-	-	-
TOTAL				**20**	**00**	**13**	**21.5**	**460**	**540**	**1000**

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

Course Structure & Scheme of Examination

II B.Tech., II Semester **Regulations: R20**

S.NO	Category	Course code	Course Title	Hours per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
1	BS	20AHS24	Statistical methods for data science	3	1	0	3	40	60	100
2	ES	20AHS14	Discrete structures and Graph theory	3	1	0	3	40	60	100
3	PC	20ACS12	Design & 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 & Analysis of Algorithms Lab	0	0	3	1.5	40	60	100
7	PC LAB	20ACS15	Operating System 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 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 (DATA SCIENCE)

Course Structure & Scheme of Examination

III B.Tech. I Semester **Regulations: R20**

S.NO	Category	Course code	Course Title	Hours per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
1	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							
		20AIT01	Automata & Complier Design							
		20ACD05	Data Analytics							
		20ACD06	Computer Graphics and Multimedia Technology							
		20ACD07	Data Modelling Techniques							
5	OE/JOE	**Open Elective/ Job Oriented Elective –I**		3	0	0	3	40	60	100
		20AEC31	Digital Logic Design							
		20ACE35	Integrated Waste Management for Smart City							
		20AME18	Robotics and Artificial Intelligence							
		20ACD08	Single Page Web Applications with AngularJS							
		20ACD09	Distributed Database and Information Systems							
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	0	100	00	100
10	AC	20AHS17	Quantitative Aptitude Reasoning-III	2	0	0	-	-	-	-
11	AC	20AHS18	French Language	2	0	0	-	-	-	-
		20AHS19	German Language							
		20AHS20	Japanese Language							
12	20ACD10/ 20ACD58	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**

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

Course Structure & Scheme of Examination

III B. Tech, II Semester **Regulations: R20**

S.NO	Category	Course code	Course Title	Hours per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
1	PC	20ACD11	Big Data Computing	3	0	0	3	40	60	100
2	PC	20ACD12	Data Visualization Techniques	3	0	0	3	40	60	100
3	PC	20ACD13	Big Data Query Languages	3	0	0	3	40	60	100
4	PE	**Professional Elective Courses-II**		3	0	0	3	40	60	100
		20ACS29	Data Warehousing and Data Mining							
		20AIT13	Software Project Management							
		20ACD14	Data compression Techniques							
		20ACD15	Knowledge Management							
		20ACD16	Data Centre and Networking Technologies							
5	OE/JOE	**Open Elective/ Job Oriented Elective -II**		3	0	0	3	40	60	100
		20AEC45	Microprocessors and Interfacing							
		20AME31	Operations Research							
		20AMB09	Intellectual Property Rights							
		20ACD17	Business Analytics							
		20ACD18	Introduction to Machine Learning: Supervised Learning							
6	PCLAB	20ACD19	Big Data Analytics with Hadoop and Spark Lab	0	0	3	1.5	40	60	100
7	PC LAB	20ACD20	Data Visualization Techniques lab	0	0	3	1.5	40	60	100
8	PC LAB	20ACD21	Big Data Query Languages 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**	**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**

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

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

Course Structure & Scheme of Examination

IV B.Tech. I Semester **Regulations: R20**

S.NO	Category	Course code	Course Title	Periods per week			*Credits*	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
1	HSS	**Humanities and social science Elective**		3	0	0	3	40	60	100
		20AMB04	Creativity and Innovation							
		20AMB05	Leadership Essentials							
		20AMB06	Law for Engineers							
		20AMB07	Entrepreneurship Essentials							
		20AMB08	Essentials of Management Science							
2	PE	**Professional Elective Courses-III**		3	0	0	3	40	60	100
		20AIT20	Software Testing							
		20ACS39	Cloud Computing							
		20ACD23	Linked Open Data and its Applications							
		20ACD24	Data Intensive Computing							
		20ACD25	Image and Video Analytics							
3	PE	**Professional Elective Courses-IV**		3	0	0	3	40	60	100
		20AIT24	Software Quality Assurance and Testing							
		20ACD26	Social Media Mining							
		20ACD27	Ethical Hacking and Network Defence							
		20ACD28	Information Retrieval System							
		20ACD29	Data Privacy							
4	PE	**Professional Elective Courses-V**		3	0	0	3	40	60	100
		20ACS28	Internet of Things (IoT)							
		20ACS46	Computer Vision							
		20ACD30	Healthcare Analytics							
		20ACD31	Text Analytics							
		20ACD32	Real Time Data Streaming							
5	OE/JOE	**Open Elective/ Job Oriented Elective -III**		3	0	0	3	40	60	100
		20AMB10	Industrial Marketing							
		20AEC56	Embedded Systems							
		20AME54	Optimization Techniques							
		20ACS47	NoSQL Databases							
		20ACD33	Introduction to Cyber Security							
6	OE/JOE	**Open Elective/ Job Oriented Elective -IV**		3	0	0	3	40	60	100
		20AME20	Total Quality Management & Reliability Engineering							
		20AEC51	Digital Image processing							
		20AMB11	Social Media Marketing							
		20ACD34	Time series data analysis							
		20ACD35	Bayesian Data Analysis							
7	SC	20ACS11	Android Application Development	1	0	2	2	40	60	100
8	MC	20AMB12	Professional Ethics	2	0	0	-	100	00	100
9	20ACD36	Industrial / Research Internship		0	0	0	3	40	60	100
TOTAL				**18**	**00**	**7**	**24.5**	**420**	**480**	**900**

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

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

Course Structure & Scheme of Examination

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	20ACD37	Project Project work, Seminar and Internship in Industry	0	0	0	12	80	120	200
	INTERNSHIP (6 MONTHS)									
TOTAL										**12**

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

POOL-I								
Semester	Course Name		L	T	P	C	PRE-REQ	Offering Department
II-II (Any 1 Course from POOL-I)	20ACD38	Cryptology	3	1	0	4	Algebra and Transformation Techniques	CSE(DS)
	20ACD39	Mobile computing	3	1	0	4	Object Oriented Programming through JAVA	CSE(DS)
	20ACD40	Reverse engineering	3	1	0	4	Computational Thinking	CSE(DS)
	20ACD41	Mining Massive dataset	3	1	0	4	Data Analytics with Python	CSE(DS)
POOL-II								
III-I (Any 1 Course from POOL-II)	20ACD42	Reinforcement Learning	3	1	0	4	Computational Thinking	CSE(DS)
	20ACD43	Web Server Programming	3	1	0	4	Object Oriented Programming through JAVA	CSE(DS)
	20ACD44	Wearable Computing	3	1	0	4	Computational Thinking	CSE(DS)
	20ACD45	Service Oriented Architecture	3	1	0	4	Software Engineering	CSE(DS)
POOL-III								
III-II (Any 1 Course from POOL-III)	20ACD46	Health Informatics	3	1	0	4	Programming for Data Science	CSE(DS)
	20ACD47	Fundamentals Of Autonomous System	3	1	0	4	Desing and Analysis of Algorithms	CSE(DS)
	20ACD48	Agent Based Intelligent Systems	3	1	0	4	Object Oriented Programming through JAVA	CSE(DS)
	20ACD49	Arduino Programming for IoT	3	1	0	4	Python Programming	CSE(DS)
POOL-IV								
III-II (Any 1 Course from POOL-IV)	20ACD50	Mobile and Pervasive Computing	3	1	0	4	Operating system	CSE(DS)
	20ACD51	Design and Development of Blockchain	3	1	0	4	Desing and Analysis of Algorithm	CSE(DS)
	20ACD52	Reconfigurable Computing	3	1	0	4	Data Modeling Techniques	CSE(DS)
	20ACD53	Firewall and Network Protection	3	1	0	4	Cyptography and Network Security	CSE(DS)
POOL-V								
IV-I (Any 1 Course from POOL-IV)	20ACD54	Digital Marketing Analytics	3	1	0	4	Data Analytics	CSE(DS)
	20ACD55	Practical Case Study on Data Science	3	1	0	4	Foundations of Data Science	CSE(DS)
	20ACD56	Web Services and API Design	3	1	0	4	Web Technology	CSE(DS)
	20ACD57	Vulnerability Analysis and Penetration Testing	3	1	0	4	Cyptography and Network Security	CSE(DS)

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

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**		

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

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

L	T	P	C
3	1	0	3

20AHS02 DIFFERENTIAL EQUATIONS AND MULTIVARIABLE CALCULUS

Course Outcomes:

After completion of the course the student will be able to

1. Classify and interpret the solution of ordinary differential equations.
2. Apply the principles of differential equations to the engineering and scientific problems.
3. Evaluate the double and triple integral to find surface area and volumes.
4. Anlyze the results and draw possible conclusions.
5. Illustrate the physical interpretation of concepts of vector calculus.

UNIT-I DIFFERENTIAL EQUATIONS

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

UNIT-II APPLICATIONS OF DIFFERENTIAL EQUATIONS

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

UNIT-III FUNCTIONS OF SEVERAL VARIABLES

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

UNIT-IV APPLICATIONS OF INTEGRATION

Length of an arc and area using integral.

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

UNIT-V VECTOR CALCULUS:

Gradient, Divergence, Curl and their properties (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.

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	-	-	-	-	-	-	-	-	-	2	2
CO2	3	2	2	2	-	-	-	-	-	-	-	-	2	2
CO3	2	2	-	1	-	-	-	-	-	-	-	-	2	2
CO4	3	2	1	-	-	-	-	-	-	-	-	-	1	1
CO5	3	2	2	2	-	-	-	-	-	-	-	-	2	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 EEE, CSE, IT, CSE(DS) & CSE (AI &ML))

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

L	T	P	C
3	0	0	3

20AHS04 ENGINEERING PHYSICS

Course Outcomes:

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

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

UNIT I OPTICS

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

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

UNIT II LASERS & FIBER OPTICS

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

UNIT III

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

CRYSTAL PHYSICS: Single crystalline, Polycrystalline and amorphous materials -Fundamental of

crystallography- Space lattice - Basis - unit cell - Lattice parameters - Crystal systems –Bravais Lattice - Structure and packing fraction of Simple cubic and body centered cubic - Miller Indices- Bragg's law- X-ray diffraction by powder method.

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

UNIT IV

SEMICONDUCTORS & SUPERCONDUCTORS

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

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

UNIT V

MAGNETISM & NANOMATERIALS

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

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

Text Books:

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

Reference Books:

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

CO PO Mapping

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

UNIT-1

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

UNIT – 2

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

UNIT-3

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

UNIT – 4

Data Structures

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

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

UNIT-5

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

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

Text Books:

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

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3							1		2		1	2
CO2	2	2									2		3	2
CO3	2	2											1	2
CO4	2	3		2							2		2	1
CO5	3	3		2							2		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
1	0	4	3

20AME01 COMPUTER AIDED ENGINEERING DRAWING

COURSE OUTCOMES:

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

CO1: Communicate his/her ideas effectively by using AutoCAD software.
CO2: Project the points, lines, planes, solids with digital environment
CO3: Represent sectional views of solids and develop the sectioned object surfaces.
CO4: Communicate his/her ideas effectively by using Orthographic Projections and Isometric Viewsusing computer software.

INTRODUCTION:

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

THEORY:

UNIT I

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

UNIT II

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

UNIT III

Projections of planes – inclined to both the principal planes.
Projection of regular solids – prisms, Pyramids, cylinders, tetrahedron and cones – axis inclined to oneplane.

UNIT IV

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

UNIT V

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

Practice:

1. Geometrical constructions:

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

2. Conics:

Constructions of Ellipse, Parabola, Hyperbola

3. Points:

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

4. Lines:

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

5. Planes:

Sketching of the planes when they are

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

6. Solids:

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

7. Sections of solids:

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

8. Development of surfaces:

Sketching of developed surfaces of

a) cylinder, prisms using parallel line method

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

9. Orthographic Projections:

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

10. Isometric projections:

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

Mapping of CO's- PO's-PSO's

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)

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

L	T	P	C
3	0	0	3

20ACS02 COMPUTATIONAL THINKING

Course Outcomes

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. Learn actions and data organization.
4. Understand software correction, testing and performance measure using computer.

UNIT –I

Computer, computer science and computational thinking, From Abacus to machine, the first software, what make it a modern computer, 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

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

UNIT- III

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

UNIT- IV

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

UNIT -V

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

Text Books:

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

Reference Books:

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

Mapping of CO's- PO's-PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3												2	
CO2	3												1	
CO3	1	2												3
CO4				2							2		2	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, CAI, CSC & CSO)

L	T	P	C
0	0	3	1.5

20AHS07 ENGINEERING PHYSICS LAB

Course Outcomes:

After completion of practical, student will be able to

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.

A minimum of 10 experiments to be conducted during the academic year

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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	-	-	-	-	-	-	-	-	-	-
CO2	3	1	-	-	2	-	-	-	-	-	-	-
CO3	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. Illustrate the concepts Stacks and Queues.
4. Design operations on Linked lists.
5. Develop searching and sorting methods.

Week l

a) Programs using I/O statements and expressions.

b) Programs using decision-making constructs.

Week 2

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

i) To find the factorial of a given integer.

ii) To solve Towers of Hanoi problem.

Week 3

a) Write a C program to find both the largest and smallest number in a list of integers.

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

i) Addition of Two Matrices ii) Multiplication of Two Matrices

Week 4

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

i) To insert a sub-string in to a given main string from a given position.

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

Week 5

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

a. Find the total number of words.

b. Capitalize the first word of each sentence.

c. Replace a given word with another word.

Week 6

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

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

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

Week 7

Write C programs that implement stack (its operations) using

i) Arrays

ii) Pointers

Week 8

Write C programs that implement Queue (its operations) using

i) Arrays

ii) Pointers

Week 9

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

i) Converting infix expression into postfix expression

ii) Evaluating the postfix expression

Week 10

Write a C program that uses functions to perform the following operations on singly linked list.

i) Creation ii) Insertion iii) Deletion iv) Traversal

Week 11

Write a C program that uses functions to perform the following operations on Doubly 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 of CO's- PO's-PSO's

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

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
-	-	3	1.5

20AME02 ENGINEERING PRACTICE LAB

COURSE OUTCOMES:

After completion of the study of this lab a student will be able to:

CO1: Perform a different prototype model in the carpentry trade such as Mortise and tenon joint, andTable stand using woodturning lathe.

CO2: Prepare models such as Dove tail joint and Half Round joint using Fitting tools and rectangulartray, and funnel prototypes in the trade of Tin smithy.

CO3: Perform various basic House Wiring techniques such Staircase wiring (i.e., control of one lampby two switches fixed at two different places), and wiring for tube light (Fluorescent Lamp)/Focus light.

CO4: Fabricate different models in a foundry shop such as single- and two-pieces patterns and prototypes in the trade of Welding such as T-Joint and H-Joint.

1. **TRADES FOR EXERCISES:**

a. Carpentry shop

1. Prepare a Mortise and tenon joint from a given 300 x 40 x 25 mm soft wood stock.
2. Prepare a Table stand (desired shape) by using wood turning

Lathe from a given300 x 40 x 25 mm soft wood stock.

b. **Fitting shop**

1. Prepare a Dove tail joint from a given 100 x 50 x 5 mm M.S. stock.
2. Prepare a Half Round joint from a given100 x 50 x 5 mm M.S. stock.

c. **Sheet metal shop**

1. Prepare a Funnel from given G.I. sheet.
2. Prepare a Rectangular Tray from given G.I. sheet.

d. **House-wiring**

1. Stair case wiring (i.e. control of one lamp by two switches fixed at two different places).
2. Prepare a wiring for tube light("Fluorescent Lamp")/Focus light

e. **Foundry**

1. Prepare a mould for a single piece pattern (Connecting rod)
2. Prepare a mould for a Double piece pattern (Stepped Pulley)

f. **Welding**

1. Prepare a T-Joint from given M.S Flat pates using Arc Welding.
2. Prepare a H-Joint from given M.S Flat pates using Arc Welding.

2. **TRADES FOR DEMONSTRATION:**

a) Plumbing
b) Machine Shop
c) Metal Cutting

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

REFERENCE BOOKS:

1. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers.
2. Engineering Practices Lab Manual, Jeyapoovan, Saravana Pandian, 4/e Vikas
3. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.
4. Engineering Workshop by Vishnu Universal Learning.
5. Engineering Workshop by GRIE institute.

Mapping of CO's- PO's-PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1	1		1	1	1	2	1	1	2		
CO2		1	1	1		1	1	1	2	1	1	2		1
CO3		1	1	1		1	1	1	2	1	1	1	2	
CO4		1	1	1		1	1	1	2	1	1	2	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, CSE (DS), CSE (AI & ML) & IT)
I B.Tech II Semester (Common to CE, ME & ECE)

L	T	P	C
2	0	0	0

20AHS09 ENVIRONMENTAL SCIENCES
(Mandatory Course)

Course Outcomes:

After completion of practical, student will be able to

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

UNIT I ECO SYSTEMS AND BIODIVERSITY AND ITS CONSERVATION:

Definition, scope and importance, Need for public awareness. Concept of an ecosystem - Structure and function of an ecosystem.- Producers, consumers, decomposers - Energy flow in the eco systems - Ecological succession - Food chains, food webs and ecological pyramids -Introduction, types, characteristicfeatures, 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 NATURAL RESOURCES:

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

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

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

c) Equitable use of resources for sustainable life styles.

UNIT III ENVIRONMENTAL POLLUTION:

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

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT:

Form unsustainable to sustainable development - Urban problems related to energy - Water conservation, rain water harvesting, water shed management - Resettlement and rehabilitation of people; its problems 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 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, 15lh Edition, 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.

Mapping of CO's- PO's-PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PS02
CO1	3	-	-	-	-	-	-	-	1	-	-	-	2	
CO2	3	1	-	-	-	-	-	-	1	-	-	-	2	3
CO3	3	2	-	-	-	-	-	-	2	-	-	-	1	
CO4	2	2	-	-	-	-	-	-	2	1	-	-		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	P	T	C
3	0	0	3

20AHS01 COMMUNICATIVE ENGLISH

Course Outcomes:

After successful completion of this course, the students will be able to:
CO1: Develop knowledge of basic grammatical concepts to understand asking and answering general questions on familiar topics and making paragraphs.
CO2: Interpret context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English
CO3: Examine language aspects to do role plays, to study graphic elements and information transfer.
CO4: Demonstrate discourse markers to make effective oral presentations and to write structured essays.

UNIT I: EXPLORATION

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

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

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

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

READING FOR WRITING: Beginnings and endings of paragraphs – introducing the topic, summarizing the main idea and/or providing a transition to the next paragraph

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

UNIT II: ON CAMPUS

LESSON: The District School as It Was by One Who Went It, Warren Burdon LISTENING: Answering a series of questions about main idea and supporting ideas after listening to audio texts.

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

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

WRITING: Paragraph writing (specific topics) using suitable cohesive devices; mechanics of writing - punctuation, capital letters.

GRAMMAR AND VOCABULARY: Cohesive devices - linkers, sign posts and transition signals; use of articles and zero article; prepositions.

UNIT III: WORKING TOGETHER

LESSON: The Future of Work

LISTENING: Listening for global comprehension and summarizing.

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

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

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

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

UNIT IV: FABRIC OF CHANGE

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

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

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

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

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

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

UNIT V: TOOLS FOR LIFE

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

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

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

READING: Reading for comprehension.

WRITING: Writing structured essays on specific topics using suitable claims and evidences
GRAMMAR AND VOCABULARY: Editing short texts –identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject verb agreement)

Text Books

1. English all round: Communication Skills for under graduation 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, HeinleyELT; 2nd Edition, 2018.
3. Skillful Level 2 Reading & Writing Student's Book Pack (B1) Macmillan Educational

CO PO 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	-	-		

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))

L	T	P	C
3	0	0	3

20AHS03 - ENGINEERING CHEMISTRY

Course Outcomes:
After completion of the course students will be able to

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

UNIT – I

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

UNIT – II

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

UNIT – III

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

UNIT – IV

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

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 AndraNaidu, BS Publications, Hyderabad, 9th edition, 2006.

CO PO 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	-	-	-	-	-	-	-	-	-	-		

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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

L	T	P	C
3	1	0	3

20AHS08 ALGEBRA AND TRANSFORMATION TECHNIQUES

Course Outcomes:

After completion of the course the student will be able to

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

UNIT-I

MATRICES: Rank of a matrix by echelon form, normal form. Solving system of 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

LAPLACE TRANSFORMS: Laplace transforms of standard functions - First Shifting Theorem -Transforms of derivatives and integrals- Unit step Function – Second Shifting Theorem

–Laplace transforms of Periodic functions – Inverse Laplace transforms - Convolution theorem. Applications of Laplace Transforms to ODE

UNIT-III

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

UNIT-IV

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

UNIT-V

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

Text Books:

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

Reference Books:

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

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

L	T	P	C
3	1	0	3

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

20AEE05 BASIC ELECTRICAL ENGINEERING

Course Outcomes:

1. After completion of this course the students will be able to:
2. Evaluate the electrical circuits and networks parameters
3. Emphasis the RLC Design models
4. Acquire the concept of all types of Electrical DC Machines and AC Machines

UNIT I: DC CIRCUITS & AC CIRCUITS

DC Circuits:

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

AC Circuits:

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

UNIT II: DC MACHINES

DC Generator:

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

DC Motor:

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

UNIT III: AC MACHINES I

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

UNIT IV: AC MACHINES II

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

UNIT V: PRINCIPLES OF ELECTRICAL SYSTEMS

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

Text books:

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

Reference Books:

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

CO-PO Mapping:

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)

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

L	T	P	C
3	1	0	3

20ACS04 PROBLEM SOLVING AND PROGRAMMING USING PYTHON

Course Outcomes:

After Completion of the course the student will be able to

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

UNIT- I INTRODUCTION TO PROBLEM SOLVING, EXPRESSION AND DATA TYPES

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

Problem solving: Restaurant Tab calculation and Age in seconds.

UNIT- II CONTROL STRUCTURES& COLLECTIONS

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

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

UNIT- III STRINGS, FUNCTIONS AND FILES

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

UNIT-IV OBJECT ORIENTED PROGRAMMING AND EXCEPTIONS

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

Problem solving: Credit card calculation.

UNIT- V INTRODUCTION TO NUMPY, PANDAS, MATPLOTLIB:

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

Text Books:

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

Reference Books:

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

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

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 completion of the course students will be able to

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

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

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

PRESCRIBED SOFTWARE FOR PRACTICE:

Sky Pronunciation, Pro-power 2 & Globarena

Reference Books

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

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

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING ANDTECHNOLOGY

(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	1.5

20AHS06 - ENGINEERING CHEMISTRY LAB

Course Outcomes:
After completion of practical, student will be able to

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

Any **TEN** of the following experiments

1. Estimation of Hardness of water by EDTA method.
2. Estimation of Chlorides in Water sample.
3. Determination of acid strength by using a pH meter (I) Strong acid VS Strong base (II) Weak acid Vs Strong base.
4. Estimation of Copper using EDTA by complexometric method.
5. Determination of effect of temperature on absolute and kinematic viscosity of oils 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.

CO - PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PS02
CO1	3	3	-	-	-	-	-	-	-	-	-	-	1	1
CO2	3	2	-	-	-	-	-	-	-	-	-	-	1	-
CO3	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)
I B.Tech II Semester (Common to EEE, CSE, IT, CSE(DS) & CSE(AI &ML))

L	T	P	C
2	-	-	-

20AMB01 DESIGN THINKING

(Mandatory Course)

Course Outcomes:

After completion of the course the student will be able to

1. Analyze design thinking concepts and principles to perform human centered design process for creative problem solving.
2. Create empathy maps to visualize user attitudes and behavior for gaining insights of customers.
3. Develop innovative products or services for a customer base using ideation techniques.
4. Build prototypes for complex problems using gathered user requirements.
5. Apply design thinking tools techniques to produce good design and relevant products or services for a specific target market.
6. Improve prototype by testing it with a specific set of users for making it sustainable by following ethics.

UNIT I: INTRODUCTION TO DESIGN THINKING

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

UNIT II: EMPATHIZE

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

UNIT III: IDEATION

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

UNIT IV: PROTOTYPING

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

UNIT V: TESTING PROTOTYPES

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

Text Books:

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

Reference Books:

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

ADDITIONAL LEARNING RESOURCES:

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

CO PO Mapping

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

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 completion of the course the student will be able to:

1. **Analyze** the transcendental equations and solve those using different methods.
2. **Apply** numerical techniques to solve engineering problems.
3. **Analyze** the data using Correlation and regression to draw the valid conclusion.
4. **Apply** the solutions of ordinary differential equations and partial differential equations to real world problems.

UNIT-I

SOLUTION OF TRANSCENDENTAL EQUATIONS AND INTERPOLATION:

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

UNIT-II

NUMERICAL DIFFERENTIATION AND INTEGRATION

Approximation of derivatives using interpolation polynomials-First and Second order derivatives – Problems on numerical differentiation. Newton Cotes formulae - Numerical integration using Trapezoidal rule, Simpson's $\frac{1}{3}$ rule and Simpson's $\frac{3}{8}$ Rule.

UNIT-III

CURVE FITTING:

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

UNIT-IV

NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS

Taylor's series - Picard's method of successive Approximations - Euler's and Modified Euler's Method - Problems on single step methods - Runge - Kutta Methods – Predictor - corrector method - Milne's method.

UNIT-V

PARTIAL DIFFERENTIAL EQUATIONS:

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

Text Books:

1. Dr.B.S.GREWAL, Higher Engineering Mathematics. Khanna publication Publications, 42th edition.
2. B.V.Ramana, A Text Book of Engineering Mathematics-I, TATA MC GRAWHILL
3. Jain.M.K, Iyengart.K.V,.Jain.R.K. Numerical Methods For Scientific And Engineering Computation. Newage International Publishers.

References Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics. JOHN WILEY & SONS-2016.
2. N.Bail, M.Goyal&C.Walking, A Text Book Of Advanced Engineering Mathematics- A Computer Approach.
3. S.S. Sastry, Introductory Methods of Numerical Analysis, Printice Hall of India publications, 2012.

CO-PO's Mapping:

CO/POS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	**3**	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Average	**3**	**2.5**	**-**	**0.25**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Level of Correlation of the Course	**3**	**3**	**-**	**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	-	-	3

20ACS06 - COMPUTER ORGANIZATION AND ARCHITECTURE

Course Outcomes:

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

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

UNIT I **7 hrs**

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

UNIT II **8 hrs**

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

UNIT III **8 hrs**

Micro programmed Control: Control memory, address sequencing, micro program example, and design of control unit. Computer Arithmetic: Fixed point representation of numbers-algorithms for arithmetic operations: multiplication (Booths, Modified Booths) - division (restoring and non-

restoring) - Floating point representation with IEEE standards and algorithms for common arithmetic operations- Representation of non-numeric data (character codes).

UNIT IV **9 hrs**

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

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

UNIT V **8 hrs**

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

Text Books:

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

Reference Books:

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

CO-PO's mapping:

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

CO-PO's Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3												3		
CO2	3	3											3		
CO3	2	3	3	3									3		
CO4	3	3		3										3	
CO5	2	3		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- Professional Elective - III)

L	T	P	C
3	-	-	3

Code: 20ACD01 FOUNDATIONS OF DATA SCIENCE

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 historical data.

UNIT I

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

UNIT II

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

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

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

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 Rachel Schutt, O'Reilly (2014).
2. Data Mining: Concepts and Techniques", Third Edition, Jiawei Han, MichelineKamber and Jian Pei, ISBN 0123814790,(2011).

CO-PO's Mapping:

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

CO-PO’s Mapping:

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

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

CO-PO's Mapping:

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

20ACD02 PROGRAMMING FOR DATA SCIENCE LAB

Course Outcomes:

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

1. To provide practical knowledge of pre-processing
2. To provide practical knowledge of various analysis techniques
3. To visualize the data with various clustering models

List of Experiments:

1. To simulate the data pre-processing techniques with existing data set.
2. To simulate the various statistical analysis on univariate and multivariate data.
3. Write a python program to calculate singular vector for given dataset.
4. Write a python program to calculate Eigen vector for given dataset.
5. Write a python program to perform random walks on undirected graphs
6. Implement perceptron algorithm using python
7. Implement the concept of overfitting problem in classification problem
8. Implement k-means clustering for a given data set using python.
9. Implement spectral clustering for a given data set using python.
10. Implement best rank-k approximation algorithm for a given data set using python

Text Books:

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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3		3								3	
CO2	3	2	3		3								3	1
CO3	3	2	3		3								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), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)

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

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

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

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

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

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

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

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

CO-PO's Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)
II B. Tech I Semester CSE (DS)

L	T	P	C
1	-	2	2

20ACD03 - DATA ANALYTICS WITH PYTHON
(Skill Course)

Course outcome:

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

1. Apply the advanced programming models to solve the complex problem in real time applications.
2. Analyse the varied data handling techniques on real time data which provides effective predictions.
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. Installation of Numpy in python
2. To understand and implement slicing and indexing operation using numpy
3. To understand and implement the concept of arrays
4. Installation of pandas in python.
5. To read various file for analysis
   (i) Csv (ii) Json (iii) text file
6. Implement the various features in pandas
   (i) sorting (ii) Ranking
7. To understand and implement the concept of reading and writing various types of files using pandas
8. To understand and implement the concept of binning
9. Implement the various plotting scheme using matplotlib.
   (ii) Bar chart (ii) Line chart (iii) Pie chart
10. Learn To handle Meteorological for analysis

Text Book(s)

1) Nelli, Fabio. Python data analytics: Data analysis and science using PANDAs, Matplotlib and the Python Programming Language. Apress, 2015.

Reference Books

1) Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, 2nd Edition October 2017

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3										3	3
CO2	2	3	2	2	2								3	3
CO3	3	3	2	2	3								3	3
CO4	2	2	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 CE, EEE, ME, ECE, CSE, IT, CSE(DS) & CSE (AI &ML))

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).

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

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

L	P	T	C
2	-	-	-

UNIT 1: QUANTITATIVE ABILITY - I

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

UNIT 2: QUANTITATIVE ABILITY - II

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

UNIT 3: REASONING ABILITY I

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

UNIT 4: VERBAL I

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

UNIT 5: SOFT SKILL I

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

II B. Tech - II Semester CSE (DS)

L	T	P	C
3	-	-	3

20AHS24 - STATISTICAL METHODS FOR DATASCIENCE

Course Outcomes

After completion of the course the student will be able to

1. Apply probability distributions to real life problems.
2. Identify the statistical methods for solving geospatial problems.
3. Apply the advanced statistical methods for image processing and to use geo statistics for studying spatially varying phenomena.
4. Analyze the classification of data and draw the conclusion by applying various sample tests.

UNIT–I

BASIC STATISTICS **9 hrs**

Collection and Classification of data – Different types of diagrams to represent statistical data – Central tendancy -Measures of central tendency, Mean Deviation, Standard Deviation-Population, sample, parameter and statistic; characteristics of a good estimator; Consistency–Invariance property of Consistent estimator, Sufficient condition for consistency; Unbiasedness. Point and Interval Estimation.

UNIT–II

PROBABILITY **9hrs**

equally likely, mutually exclusive events, definitions of probability, additions & multiplication theorems of probability and problems based on them. Bayesian approach, distributions; Binomial, Poisson, normal distributions.

UNIT - III

STATISTICAL POPULATION **9hrs**

Random sampling- simple random sampling and stratified random sampling; estimates of population mean and population total and standard errors of these estimates in both the sampling schemes-Mean of Sampling distribution of means- Standard deviation of Sampling distribution of means (With repetition & Without repetition).

UNIT - IV

TEST OF HYPOTHESES **9hrs**

Types of errors -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-square test for goodness of fit and test for independence of attributes, χ^2test for testing variance of a normal distribution.

UNIT - V

STATISTICAL QUALITY CONTROL **9hrs**

statistical quality control: x charts; R-Chart p- Chart, np-Chart and c charts and their uses (mainly applications); elementary idea of sampling inspection plan.

DESIGN AND ANALYSIS OF EXPERIMENTS: Analysis of Variance- One way and two-way classifications.

Text Books:

1. S.P.Gupta,Statistical Methods,33rdEdition,publicationsSultanChand& Sons.2021
2. Miller and John Freund. E, Probability & Statistics for Engineers, New Delhi, Pearson Education, 2014.
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.

CO/POS	PO1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
CO1	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	**3**	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

20AHS14 DISCRETE STRUCTURES AND 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:

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:

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:

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

UNIT- IV:

RECURRENCE RELATION: Generating Functions, Sequences, Calculating Coefficient of generating functions, Recurrence relations. Solving recurrence relation by substitution. Generating

functions and Characteristic equations (both homogeneous and non-homogeneous Recurrence Relation).

UNIT-V:

GRAPH THEORY: Representation of Graph, Directed Graph, Sub graphs, Isomorphism of Graphs, Planar Graphs, Connected Graphs, Euler and Hamiltonian circuits and their necessary and sufficient conditions for existence of 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.

CO-PO's Mapping:

CO/POS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	**3**	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Average	**3**	**2.5**	**-**	**0.25**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Level of Correlation of the Course	**3**	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

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 **8hrs**

Basics of Algorithms and Mathematics:

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

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

UNIT-II ` **9hrs**

Divide and Conquer Algorithm:

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

UNIT-III **8hrs**

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

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

UNIT-IV **7hrs**

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

UNIT-V

Backtracking **8hrs**

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

Introduction to NP, Completeness:

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

Text Books:

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

Reference Books:

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

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

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 8hrs

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

UNIT II

SCHEDULING 8hrs

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

UNIT III

PROCESS SYNCHRONIZATION & DEADLOCK 8hrs

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

UNIT IV 7hrs

MEMORY MANAGEMENT STRATEGIES

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

UNIT V 8hrs

FILE SYSTEM INTERFACE

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

Text Books:

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

Reference Books:

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

CO-PO's Mapping:

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

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

CO-PO's Mapping:

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

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 assorting, graph related, combinatorial, etc., in a high-level language tools.
3. Analyze and compare the performance of algorithms using language features.
4. Apply and implement learned algorithm design techniques and data structures to solve real-world problems.

LIST OF EXPERIMENTS

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

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

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. Simulate the principles of CPU scheduling concepts.
3. Simulate the principles of synchronization and contiguous memory allocation technique.
4. Simulate the principle of page replacement algorithm

LIST OF EXPERIMENTS

1. Explain the following system calls in UNIX operating system (fork, exec, mkdir, cat, open, date, history, clear, pwd, ls, cd)
2. Write a shell script program
   (a) To perform arithmetic operations.
   (b) To find the given number is odd or even
3. Implement the various process scheduling mechanisms such as FCFS, SJF, Priority, round – robin.
4. Implement the solution for reader – writer's problem.
5. Implement the solution for dining philosopher's problem.
6. Implement banker's algorithm.
7. Implement the first fit; best fit and worst fit file allocation strategy.
8. Write a C program to simulate page replacement algorithms a) FIFO b) LRU c) LFU
9. Write a C program to simulate disk scheduling algorithm a)FIFO b)SCAN c)CSCAN

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

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 skills such as distributed

List of Experiments:

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

References:

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

Online Learning Resources/Virtual Labs:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

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

DATA ANALYTICS WITH R

course outcome:

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.
2) Write a R program to simulate functional programming of statistical parameter (mean, median and mode)
3) Simulate the concept of data cleaning using data set.
4) Simulate the concept of handling missing values with average.
5) Implement the various plotting scheme using R.
6) Bar chart (ii) Scatter plot (iii) Box plot
7) To understand and implement the concept of loop statement
8) To understand and implement the concept of vectors
9) To understand and implement the concept of various models in R
10) 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

3) Beginning Data Science in R: Data Analysis, Visualization, and Modelling for the Data Scientist. by Thomas Mailund

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

20AHS15 Quantitative Aptitude and Reasoning-II

(Audit Course)

L	P	T	C
2	0	0	0

UNIT 1: 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 2: 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 3: REASONING ABILITY II

Syllogism – Statement and Conclusion - Data Sufficiency – Data Arrangement – Linear and Circular arrangement - Data Interpretation - Line Graph – Bar graph – Pie Chart -

UNIT 4: 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 5: SOFT SKILL II

Time Management - Stress Management - Team Work - Accent and Voice Communication - Interview Skills

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	0	0	3

20AMB03- MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Outcomes:
After the completion of the course student will be able to:
CO1: Explain the fundamental concepts and theoretical principles of the Economics
CO2: Apply economic principles for problem solving.
CO3: Identify market structures and types of business organizations.
CO4: List features, steps, merits, uses & limitations of Pay Back, ARR, NPV, PI & IRR methods of Capital Budgeting
CO5: Explain the basic concepts of book keeping and accounting, and analyze financial statements.

UNIT –I: INTRODUCTION TO 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 EvenPoint (BEP)–Break Even Chart –Assumptions underlying and Practical significance of BEP (Simple Problems).

UNIT –III: INTRODUCTION TO MARKETS AND BUSINESS ORGANIZATIONS: Market structures –Types of Competition –Features of perfect competition, Monopoly, Monopolistic competition –Price-Output Determination under perfect competition 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 ANALYSIS THROUGH RATIOS: Double entry book keeping –Journal –Ledger –Trial Balance –Trading Account and balance sheet with simple adjustments Ratio analysis: Computation of Liquidity Ratios (Current and Quick Ratio), Activity Ratios (Inventory Turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debt-Equity Ratio and Interest Coverage Ratio) and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratio and EPS).

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 Age international, 2009.

Reference Books:

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

CO-PO MAPPING

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

4- 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	0	0	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 webpages.
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, Microformats.

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", 4th Edition, 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)

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	2	-	-	3	1	-	-	-	3	-	3	2	-
C03	3	3	3	-	-	1	1	-	-	-	-	3	2	-
C04	-	-	3	3	3	-	-	1	-	-	1		-	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
[AUTONOMOUS]
III B. Tech I Semester (Common to CSE, IT, CSE (DS), CSE (AI & ML))
III B. Tech I Semester EEE (Open Elective-I)
IV B. Tech I Semester ME (Open Elective-I)

L	T	P	C
3	0	0	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 hours**

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 hours**

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 **10 hours**

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

UNIT-IV **8 hours**

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

UNIT-V **5 hours**

The Application Layer: Domain Name System, Electronic Mail. World Wide Web.

Total: 46Hrs

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.

CO-PO MAPPING

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

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	0	0	3

20ACS18 - CRYTOGRAPHY 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**

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**

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**

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**

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**

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.

TOTAL=45Hrs.

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

CO-PO MAPPING

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
[AUTONOMOUS]
III B. TECH I-SEMESTER CSE[DS]
II B. Tech I Semester (Common to CSE, IT & CSE (AI &ML))

L	T	P	C
3	0	0	3

20AIT01 - AUTOMATA AND COMPILER DESIGN
(Professional Elective -I)

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 Bit tools (REs, Automata) of automata theory.

2.Analyze various intermediate forms of source programs.

3.Apply the code optimization techniques in the generation of code for a given real time problem.

UNIT-I COMPILER, FORMAL LANGUAGE, REGULAR EXPRESSIONS:

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

UNIT-II CONTEXT FREE GRAMMARS AND GRAMMAR PARSING:

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

UNIT-III SEMANTICS, RUN TIME STORAGE MANAGEMENT:

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

UNIT-IV INTERMEDIATE CODE GENERATION

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

UNIT-V CODE OPTIMIZATION AND CODE GENERATION

Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs,Data flow analysis of flow graphs. Machine dependent code generation, Issues in the design of codegeneration, 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, Ravisethi, 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 LearningPublisher, New Delhi.
3. Principles of Compiler Design 3rd Edition, Balakrishnan S, Sai Publishers.

CO-PO's Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
[AUTONOMOUS]
III B. TECH I-SEMESTER CSE[DS]
II B. TECH II-SEMESTER CSE (Minor in Data science)

L	T	P	C
3	0	0	3

20ACD05 - DATA ANALYTICS
(Professional Elective -I)

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	3
CO3	3	3	2										2	3
CO4	3	2	2										3	3

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. TECH I-SEMESTER CSE[DS]

L	T	P	C
3	0	0	3

20ACD06 - COMPUTER GRAPHICS AND MULTIMEDIA TECHNOLOGY

(Professional Elective Courses-I)

COURSE OUTCOMES:

At the end of the course, the students should be able to:

1. Identify various color models and color selection for creating basic graphics.
2. Explain two-dimensional graphics, three-dimensional graphics and apply three dimensional transformations.
3. Apply Illumination and color models and apply clipping techniques to graphics.
4. Apply different types of Multimedia File Format

UNIT I ILLUMINATION AND COLOR MODELS 9

Light sources - basic illumination models — halftone patterns and dithering techniques; Properties of light - Standard primaries and chromaticity diagram; Intuitive colour concepts - RGB colour model - YIQ colour model - CMY colour model - HSV colour model - HLS colour model; Colour selection. Output primitives — points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

UNIT II TWO-DIMENSIONAL GRAPHICS 9

Two dimensional geometric transformations — Matrix representations and homogeneous coordinates, composite transformations; Two-dimensional viewing – viewing pipeline, viewing coordinate reference frame; window-to-viewport coordinate transformation, Two- dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

UNIT III THREE-DIMENSIONAL GRAPHICS 9

Three dimensional concepts; Three-dimensional object representations — Polygon surfaces- Polygon tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations — Bezier curves and surfaces -B-Spline curves and surfaces. Transformation And Viewing: Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations; Three-dimensional viewing — viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

UNIT IV MULTIMEDIA SYSTEM DESIGN & MULTIMEDIA FILE HANDLING 9

Multimedia basics − Multimedia applications − Multimedia system architecture − Evolvingtechnologies for multimedia − Defining objects for multimedia systems − Multimedia data interface standards − Multimedia databases. Compression and decompression − Data and file format standards − Multimedia I/O technologies − Digital voice and audio − Video image and animation − Full motion video − Storage and retrieval technologies.

UNIT V HYPERMEDIA **9**

Multimedia authoring and user interface - Hypermedia messaging, Mobile messaging − Hypermedia message component − Creating hypermedia message − Integrated multimedia message standards − Integrated document management − Distributed multimedia systems.

CASE STUDY: BLENDER GRAPHICS Blender Fundamentals – Drawing Basic Shapes – Modelling – Shading & Textures.

TOTAL=45Hrs.

TEXT BOOKS:

1. Donald Hearn and Pauline Baker M, ―Computer Graphics", Prentice Hall, New Delhi, 2007.
2. Andleigh, P. K and Kiran Thakrar, Multimedia Systems and Design‖, PHI, 2003.

REFERENCES:

1. Judith Jeffcoate, ―Multimedia in practice: Technology and Applications‖, PHI, 1998.
2. Foley, Vandam, Feiner and Hughes, Computer Graphics: Principles andPractice‖, 2nd Edition, Pearson Education, 2003.
3.Jeffrey McConnell, ―Computer Graphics: Theory into Practice‖, Jones and BartlettPublishers,2006.
4.Hill F S Jr., "Computer Graphics", Maxwell Macmillan, 1990.
5.Peter Shirley, Michael Ashikhmin, Michael Gleicher, Stephen R Marschner, Erik Reinhard, KelvinSung, and AK Peters, ―Fundamentals of Computer Graphics‖, CRC Press, 2010.
6.William M. Newman and Robert F.Sproull, ―Principles of Interactive Computer GraphicsMc Graw Hill 1978. https://www.blender.org/support/tutorials/

CO-PO Mapping

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. TECH I-SEMESTER CSE[DS]

IV B. TECH I SEMESTER (CSE- PROFESSIONAL ELECTIVE COURSES-V)

L	T	P	C
3	0	0	3

20ACD07- DATA MODELLING TECHNIQUES
(Professional Elective -I)

COURSE OUTCOME:

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

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

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

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

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

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.

CO-PO 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	2
CO4	3	2	2	-	-	-	-	-	-	-	-	-	2	2
CO5	2	2	2	-	-	-	-	-	-	-	-	-	2	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. TECH I SEMESTER (COMMON TO CSE, IT, CSE(DS), CSE (AI &ML))

L	T	P	C
3	0	0	3

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

Course Outcomes:

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

CO1: understand the number system and boolean algebra.

CO2: Implement various boolean expressions using logic gates.

CO3: Design combinational and sequential circuits for various practical applications.

CO4: Implement LSI and MSI circuits using programmable logic devices (PLDs)

UNIT- I NUMBER SYSTEM & BOOLEAN ALGEBRA:

Digital systems, Binary Numbers, Octal Numbers, Hexadecimal Numbers, Number base conversions, complements of numbers, Signed Binary numbers, Binary Arithmetic: addition, subtraction, multiplication, division Binary codes. Boolean algebra – Basic definition, Basic theorems and properties, Boolean Functions, Canonical & Standard forms, other logic operations & Digital logic gates.

UNIT-II GATE LEVEL MINIMIZATION:

The map method, four variable K-map, five variable K-map, POS & SOP Simplification, Don't care conditions, NAND & NOR Implementation, other two-level Implementations, Exclusive-OR Function.

UNIT- III COMBINATIONAL CIRCUITS:

Combinational circuits, Analysis & Design procedure, Binary Adder and Subtractor, Decimal Adder, Binary Multiplier, Magnitude comparator, Decoder, Encoders, Multiplexers, De-multiplexers, Code Converters, priority encoders, Realization of Switching Functions Using PROM, PAL and PLA

UNIT-IV SEQUNTIAL CIRCUITS:

Sequential Circuits, Latches, Flips-Flops, Conversion of Flip Flops, Analysis of Clocked sequential circuits, State Reduction & Assignment, Design procedure, Registers & Counters – Registers, Shift Registers, Ripple Counters, Synchronous counters, Design of modulo-N Counters, Ring and Johnson Counters

UNIT-V MEMORIES:

Random - Access Memory, Memory Decoding, Error Detection and correction, Read - Only Memory, Programmable Logic Array (PLA), Programmable Array Logic (PAL), Sequential Programmable Devices.

Text Books:

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

2) Fundamentals of Logic Design, 5/e, Roth, Cengage. **Reference Books:**

1) Digital Logic and Computer Design, M.Morris Mano, PEA.

2) Digital Logic Design, Leach, Malvino, Saha, TMH.

3) Modern Digital Electronics, R.P. Jain, TMH.

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	3	3									3	
CO3	3	3	3	3									3	1
CO4	3	3	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 (Common to CSE, IT, CSE(DS), CSE (AI &ML))

IV B. Tech I Semester ME (Open Elective – III)

L	T	P	C
3	0	0	3

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

Course Outcomes:

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

1. Understand the current issues and management in solid waste.
2. Apply basics of municipal solid waste management.
3. Apply various disposal methods of solid waste
4. Understand the construction and demolition waste management processes.
5. Explain management of electronic waste

UNIT-I
INTRODUCTION TO SOLID WASTE MANAGEMENT:

Municipal Solid Waste Sources; composition; generation rates Swachh Bharat Mission and Smart Cities Program, Current Issues in Solid Waste Management and Review of MSW Management Status in First List of 20 Smart Cities in the Country.

UNIT-II
MUNICIPAL SOLID WASTE MANAGEMENT:

Municipal Solid Waste, Characteristics and Quantities, Collection, Transportation, Segregationand 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&DWaste 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.

TEXT BOOKS

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 McGraw Hill, 1993.

3. The Central Public Health and Environmental Engineering Organization (CPHEEO),"Manual on Solid Waste Management", India, 2016.

REFERENCES

1. "Municipal Solid Waste Management Rules 2016", Central Pollution Control Board, Govt.of India, 2016.
2. "Electronic Waste Management Rules 2016", Central Pollution Control Board, Govt. of India, 2016.
3. "Construction and Demolition Waste Management Rules 2016", Ministry of Environmentand Forest and Climate Change, Govt. of India, 2016.

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	3	-	-	-	-	-	3	3
CO3	3	-	-	-	-	3	3	-	-	-	-	-	3	3
CO4	3	-	-	-	-	3	3	-	-	-	-	-	3	3
CO5	3	-	-	-	-	3	3	-	-	-	-	-	3	3
AVG	3	-	-	-	-	3	3	-	-	-	-	-	3	3
Level of correlation of the course	**3**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**3**

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

III B. Tech - I – Semester ME

L	T	P	C
3	0	0	3

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

Course Outcome:

Upon successful 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 8 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 12 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: IV Manipulator Kinematics and Trajectory Planning 16 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: V Robot Applications and Programming 7 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.

Textbooks

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

Reference Books

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

Mapping of COs with POs & PSOs

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO-1	3											3	3	2
CO-2	3					2						3	3	2
CO-3	3	3	3									3	3	2
CO-4	3	3	3	3								3	3	2
CO-5	3	3			3							3	3	2

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 [DS], CSE [AI&ML])

III B. TECH II-SEMESTER (CSE – Professional Elective – II)

L	T	P	C
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

- Explain the intermediate and advanced web development practices in JavaScript.
- Identify the features and functional components of React for Web Development.
- Find and use code packages of Node.js for creating cross-platform JavaScript runtime environment.
- 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 - Ajax with $http Service - Directives: Dynamic HTML - Directives: Dynamic HTML - restrict Property - Directive's Isolate Scope: "=" and "@" - Directive's Isolate Scope: "=" and "@" - Using Controllers Inside Directives - Using Controllers Inside Directives - Directive APIs and "&" - Directive APIs and "&" - Manipulating the DOM with link - Manipulating the DOM with link- Using Directive's transclude to Wrap Other Elements - 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 resolve- Routing State with URL Parameters - 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-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

CO-PO Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B. TECH I-SEMESTER (Common to CSE[DS] & CSE[AI&ML])

L	T	P	C
3	0	0	3

20ACD09 - DISTRIBUTED DATABASE AND INFORMATION SYSTEMS

(Job Oriented Elective – I)

COURSE OUTCOMES:

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

- Describe the concepts of distributed relational database and query processing.
- Summarize distributed security techniques and database recovery.
- Apply the appropriate protocols for symmetric and asymmetric cryptosystems.
- Analyze the functions and components of Information system.
- Analyze the decision support system and tools for Business operations.

UNIT 1 INTRODUCTORY 9 Hrs.

Data Fragmentation - Replication and allocation techniques for DDBMS - Methods for designing and implementing DDBMS - designing a distributed relational database - Architectures for DDBMS - Cluster federated - parallel databases and client server architecture - Overview of query processing.

UNIT 2 DISTRIBUTED SECURITY 9 Hrs.

Overview of security techniques - Cryptographic algorithms - Digital signatures – Distributed Concurrency Control – Serializability theory - Taxonomy of concurrency control mechanisms - Distributed deadlocks – Distributed Database Recovery - Distributed Data Security - Web data management - Database Interoperability.

UNIT 3 ADVANCES IN DISTRIBUTED SYSTEMS 10Hrs

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 8 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	3
CO2	3	2	3	-	-	-	-	-	-	-	-	-	3	2
CO3	3	3	2	-	-	-	-	-	-	-	-	-	3	2
CO4	3	2	2	-	-	-	-	-	-	-	-	-	3	2
CO5	3	2	1	-	-	-	-	-	-	-	-	-	2	2

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
0	0	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 states List.
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.

CO-PO MAPPING

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

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))
20ACS26 - COMPUTER NETWORKS LAB

L	T	P	C
0	0	3	1.5

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. Design and Analyze the performance of transmission control protocol in different scenario
10. Design and analyze the performance of a set of local area networks interconnected by switches and hub.

CO-PO MAPPING

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

L	T	P	C
1	0	2	2

20AHS16 - ADVANCED ENGLISH COMMUNICATION SKILLS LAB
(Skill Course)

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

CO1: Develop language fluency through conversational practices and demonstrate appropriate body language during communication.

CO2: Interpret and apply synonyms, antonyms, one-word substitutes, prefixes and suffixes to develop vocabulary to comprehend oral and written communication.

CO3: Analyze reading and writing techniques in preparing letters, resumes and technical reports by examining and applying guessing meaning, scanning, skimming and interfering meaning.

CO4: Demonstrate ability to function effectively as an individual and as a member in diverse teams examining and applying skills in Oral presentations, Interviews and Group Discussions.

UNIT – 1

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 - 2

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

UNIT - 3

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

UNIT - 4

PRESENTATION SKILLS – Oral Presentations (individual or group) through JAM Sessions/Seminars/PPTs and Written Presentations through Posters/Projects/Reports/e-mails/Assignments, etc.

UNIT - 5

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.

CO-PO MAPPING

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

Correlation Levels: 3 - High Mapping 2 - Medium Mapping 1 - Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

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

20AHS21 - INDIAN CONSTITUTION
(Mandatory Course)

L	T	P	C
2	0	0	0

Course Outcome:
Upon successful completion of the course the students will be able to

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

UNIT: I Preamble and its Philosophy 10 hours
Introduction to Indian Constitution, Evolution of Indian Constitution, preamble and its philosophy.

UNIT: II Union Legislature 10 hours
The Parliament, Parliamentary Structure, Process of Legislation, President of India - Powers and Functions; Prime Minister and Council of Ministers; Constitution Amendment Procedure.

UNIT: III Federalism in India 10 hours
Centre-State Administrative Relationship; Governors - Powers and Functions; State Legislature - Composition and powers; Chief Ministers - Powers and Functions; The Election Commission - Powers and Functions.

UNIT: IV Judiciary and Public Services 10 hours
The Union Judiciary - Supreme Court and High Court; Fundamental Rights and Duties All India Services - Central Civil Services -State Services - Local Services.

UNIT: V International Participation 10 hours
Foreign Policy of India; International Institutions Influence: UNO, WTO, WHO, SAARC, International Summits: BRICS, NSS, UNEP - India's Role in International Negotiations; Environmentalism in India.

Textbooks

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

Reference Books

2. Mahendra Pal Singh, V. N. Shukla, Constitution of India, Eastern Book Company, 2011.
3. J. N. Pandey, Constitutional Law of India - Central Law Agency, 1998

CO-PO Mapping

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. Tech - I Semester (Common to All Branches)

L	T	P	C
2	0	0	0

20AHS17 - QUANTITATIVE APLITUDE REASONING III
(Audit Course)

Course Outcomes:

After completion of the course the student will be able to

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

UNIT 1: QUANTITATIVE ABILITY V

Time and Work – Equal Efficiency – Different Efficiency – Combined work – Alternate work – Partial work – Negative work - Pipes and Cistern – Simple Interest – Compound Interest - Year Zero – Difference between SI and CI – Clocks – Angle of the Clock –Minutes hand Loss or Gain – Calendars – Leap Year – Non-Leap year – Odd days – Days of the week

UNIT 2: QUANTITATIVE ABILITY VI

Mensuration 2D – Area and Perimeter - Mensuration 3D – Volume - Total Surface area – Lateral Surface Area – Statistics- Mean - Mean Deviation – Median – Mode - Range – Variance – Standard Deviation - Set theory

UNIT 3: REASONING ABILITY III

Puzzles – Cubes & Dices – Algebra – Selection Decision table – Visual reasoning - Inequalities

UNIT 4: VERBAL III

Vocabulary - Synonyms, Antonyms, One Word Substitution, and Spelling - Sentence Correction - Sentence Selection, Error Identification, Sentence Improvement, Sentence completion – Cloze Test, Types, Strategies - Para jumbles- Types, Strategies.

UNIT 5: SOFT SKILLS III

Written Communication - Listening Skills - Mentoring & Coaching - Decision Making - Competitiveness - Inspiring & Motivating.

Text Books:

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

CO-PO MAPPING

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

Correlation Levels: 3 - High 2 - Medium 1 - Low

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. Tech - I Semester (Common to All Branches)

L	T	P	C
2	0	0	0

20AHS18 - FRENCH LANGUAGE
(Audit Course)

COURSE OUTCOMES:
After completion of the course the student will be able to:
CO1: Demonstrate basic knowledge of French language and analyze several core competencies.
CO2: Develop and improve comprehensive capabilities and apply simple phrases & sentences in real-life conversation.
CO3: Demonstrate ability to ask and answer questions about the self, personal interest, everyday life, and the immediate environment.
CO4: Apply the knowledge of tenses in making sentences for day-to-day conversations in different time frame.

UNIT-1 INTRODUCTION & PRESENTATION:
Conversation, Introduction, Alphabets & Accents Culture, Formal & Informal – Use of 'tu' and 'vous', Map of France: Geographical, Administrative Greeting, Presenting oneself & others, Asking & giving identity, Days of the week, Months of the year, Numbers, Nationality, Profession, Making a visiting card salutations, Gestures & Handshakes.
Grammar – Verb "appeller", 'avoir', 'etre' and Pronouns.

UNIT-2 RENDEZVOUS:
Conversation, approaching someone, Tele conversation, Buying a train ticket, Numbers the formula to write a post card, Culture and Life in France.
Grammar – Passe Compose, Verbs "aller", "partir", "venir", "prendre", Definite & Indefinite Articles.

UNIT-3 AGENDA & INVITATION:
Conversation, Time, Fixing a meeting, Alimentation, Moments of the day (from morning to night), Punctuality, Good moments of the day, Inviting someone, Accepting & Refusing Invitations, Family tree, Describing a house interior.
Grammar – Verbs "savoir", "vouloir" , "pouvoir", Future Proche, Pronom Tonique Consists of exercises and images to be used in the class by the students, Pronoun 'on', Expression of quantity with partitif article, Possessive Adjectives and Verbs "finir", "faire,".

UNIT-4 VACATION & SHOPPING:
Describing an event, Reservations at a Hotel, Describing a person, Expressing opinion, Indication of time: Depuis & pendant, Gestures: Polite & Impolite, A French vacation, Culture, Making a purchase, Choosing & Paying, Trying a dress on, Talking about weather, Understanding a Weather Bulletin, Comparison, Dress & weather, Dialogue between a client and an employee of a store and Money in everyday life in France: Parking ticket / telephone card.Grammar –

Imparfait & Passe Compose and Adjectives.

UNIT-5 ITINERARY, EXCURSION & WEEKEND:

Asking for & giving directions, Giving order / advice / prohibition, Reservation at a restaurant, Taking an order, Asking for bill at a Restaurant, Expression of Quantity, Alimentation: Shopping list (portions), Making Suggestion & Proposal, Going for an outing, Acceptance & Refusal of an invitation, Giving arguments: favour & against, A French Weekend.

Grammar – Ordinal Verbs of Movement.

Text Books:

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

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.

CO-PO MAPPING

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

Correlation Levels: **3 - High 2 - Medium 1 - Low**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. Tech - I Semester (Common to All Branches)

L	T	P	C
2	0	0	0

20AHS19 - GERMAN LANGUAGE
(Audit Course)

COURSE OUTCOMES:

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

CO1: Demonstrate fundamental knowledge to learn German language, sounds, pronunciations, sentence structures and the verb conjugation.

CO2: Comprehend and apply the knowledge of vocabulary and phrases in day-to-day real-life conversation.

CO3: Apply various sentence structures by examining the rules of grammar in speaking and writing.

CO4: Analyze and apply the various verb structures of English and German language effectively in professional writing.

UNIT-1 GERMAN SOUNDS

Vowels, consonants, diphthongs, umlaut, the nouns, gender distinctions, cases, definite and indefinite articles, conjugation of verbs, verbs with separable and inseparable prefixes, modal verbs, personal pronouns, possessive pronouns, reflexive pronouns, cases nominative, accusative and dative. Structure of sentence and categories of sentences, subordinate clause, causative and conditional sentences; A very interesting slideshow presentation is held to enlighten the students about the culture, people, and lifestyle in Germany.

UNIT-2 SENTENCE FORMATION

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

UNIT-3 GERMAN BASIC GRAMMAR

Verbs: Different forms, past tense and present perfect tense, adjectives and their declension, degrees of comparison; Prepositions, genitive case conjunctive. Different conjunctions (coordinating and subordinating), simple, complex and compound sentences, active and passive voice, relative pronouns.

UNIT-4 PURPOSE OF LANGUAGE STUDY

Pictures and perceptions, conflicts and solutions, change and the future, the purpose of the

study of the German language, listening, understanding, reacting, speaking, communicating, use of language, pronunciation and intonation, reading, reading and understanding, writing, text writing, text forming, use of language, language reflection, building up the language, language comparison, culture reflection, other cultures and cultural identity.

UNIT-5 GERMAN ADVANCED COMMUNICATION LEVEL - 1

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

TEXT BOOKS:

1. Korbinian, Lorenz Nieder Deutschals Fremdsprache IA. usländer,

"German Language", Perfect Paperback Publishers, 1st Edition, 1992.

2. Deutschals Fremdsprache, IB, Erganzungskurs, "German Language", Front Cover. Klett, Glossar Deutsch-Spanisch Publishers, 1st Edition, 1981.

REFERENCE BOOKS:

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

CO-PO MAPPING

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

Correlation Levels: **3 - High 2 - Medium 1 – Low**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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

L	T	P	C
2	0	0	0

20AHS20 - JAPANESE LANGUAGE
(Audit course)

Course Outcomes:

CO1: Remember and understand Japanese alphabet and demonstrate basic structures of sentences in reading and writing.

CO2: Analyze the limitations of language by examining pronouns, verbs form, adjectives and conjunctions.

CO3: Demonstrate the skills of vocabulary and apply it to learn time and dates and express them in Japanese.

CO4: Analyze the formation of simple questions and answers in Japanese to know the Japanese culture and etiquette.

UNIT – 1

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 20 pronouns, Greetings.

UNIT – 2

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 - 3

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 'Ga arimasu' 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 - 4

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 - 5

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.

CO-PO MAPPING

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

Correlation Levels: 3 - High 2 - Medium 1 - Low

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. TECH II-SEMESTER (Common to CSE(DS) and CSE (AIML))

L	T	P	C
3	0	0	3

20ACD11 - BIG DATA COMPUTING

Course Outcome

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

- Explain fundamental characteristics and best practices of Big Data Analytics.
- Define concept of Hadoop Ecosystem and its associated components in the Hadoop Framework.
- Analyze the key features of Apache Spark in developing and executing Big Data Applications.
- Analyze the essential characteristics of HBASE and Kafka.
- Examine the algorithms for Big Data Applications.

UNIT – 1: INTRODUCTION TO BIG DATA 8

Introduction to Big Data: Big Data and Business case – Building the Big Data Team - Big Data Big Data Enabling Technologies: Sources-Nuts and Bolts of Big Data- Big Data Security - Compliance - auditing and protection-Evolution of Big Data-Best practices for Big Data Analytics-Big Data characteristics- Volume - Veracity - Velocity - Variety- Structure of Big Data.

UNIT - 2: HADOOP DISTRIBUTED FILE SYSTEM AND MAP REDUCE PROGRAMMING 10

Hadoop Stack for Big Data - Introduction to Hadoop- Hadoop Distributed File System (HDFS) - Hadoop MapReduce 1.0 - Hadoop MapReduce 2.0 -Advanced Features of Hadoop MapReduce 2.0 - MapReduce Examples.

UNIT – 3: BIG DATA ANALYTICS USING SPARK 9

Parallel Programming with Spark - Introduction to Spark- Spark Built-in Libraries
Design of Key-Value Stores - Data Placement Strategies - CAP Theorem- Consistency Solutions - Design of Zookeeper - CQL (Cassandra Query Language).

UNIT – 4: WORKING WITH HBASE, KAFKA AND BIG DATA MACHINE LEARNING 10

Design of HBase-Spark Streaming and Sliding Window Analytics - Sliding Window Analytics-Introduction to Kafka.
Big Data Machine Learning - Machine Learning Algorithm- K-means using Map Reduce for Big Data Analytics-Parallel K-means using Map Reduce on Big Data Cluster Analysis

UNIT – 5: ALGORITHMS FOR BIG DATA ANALYTICS 8

Decision Trees for Big Data Analytics - Big Data Predictive Analytics - Parameter Servers - PageRank Algorithm in Big Data - Spark GraphX & Graph Analytics. Case Study: Flight Data Analysis using Spark GraphX

Total: 45 Hrs

Text Books:

1. Ohlhorst, Frank J. Big data analytics: turning big data into big money. Vol. 65. John Wiley & Sons, 2012.
2. Tom White, "HADOOP: The definitive Guide", O Reilly 2012.
3. Guller, Mohammed. Big data analytics with Spark: A practitioner's guide to using Spark for large scale data analysis. Apress, 2015.

Reference Books:

1. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, "Professional Hadoop Solutions", Wiley, ISBN: 9788126551071, 2015.
2. Tom Plunkett, Brian Macdonald et al, "Oracle Big Data Handbook", Oracle Press, 2014.
3. Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics, Bill Franks, John Wiley &Sons, 2012.

Web References:

1. https://archive.nptel.ac.in/courses/106/104/106104189/
2. https://hadoop.apache.org/docs/
3. https://spark.apache.org/docs/

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	-	-	-	-	-	-	-	-	-	3	2
CO2	3	2	2	-	2	-	-	-	-	-	-	-	3	2
CO3	3	2	2	2	-	-	-	-	-	-	-	-	2	2
CO4	3	2	1	-	2	-	-	-	-	-	-	-	2	2
CO5	2	2	1	-	2	-	-	-	-	-	-	-	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(DS)

III B.Tech II Semester IT (HONORS DEGREE – POOL III)
IV B.Tech I Semester CSE(Professional Elective-IV)

L	T	P	C
3	0	0	3

20ACD12 - DATA VISUALIZATION TECHNIQUES

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

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

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

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

Drawing with data – Scales – Axes – Updates, Transition and Motion – Interactivity - Layouts – Geomapping – Exporting, Framework – T3, .js, tablo.

UNIT V SECURITY DATA VISUALIZATION 9

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.

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	3	2	-	-	-	-	-	-	-	-	-	3	1
CO3	3	2	2	-	-	-	-	-	-	-	-	-	2	2
CO4	3	2	2	-	-	-	-	-	-	-	-	-	2	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B. TECH II-SEMESTER CSE[DS]

L	T	P	C
3	0	0	3

20ACD13 - BIG DATA QUERY LANGUAGES

COURSE OUTCOME

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

1. Explain various programming features of R Programming.
2. Use HADOOP Integrated Programming Environment and RHDOOP FOR data analysis.
3. Apply Real-Time Analytical Processing for Bigdata Streams.
4. Apply Pig scripts to process and analyze large datasets representing them as data flows.
5. Analyze Big Data Querying processing and Data Manipulation using HiveQL.

UNIT I INTRODUCTION TO R PROGRAMMING 9

Introduction to R – Vectors – Filtering – Matrices – Creating Matrices – Applying Functions to Matrix Rows and Columns – Lists – Creating List – General List Operations – Data Frames – Creating Data Frames – Matrix like Operations in Frames – Applying Functions to Data Frames – Factors and Tables – Math and Simulations in R – Input/Output – Reading and Writing Files – Graphics – Creating Three-Dimensional Plots – Linear Models – Non-linear models – Clustering

UNIT II DATA ANALYSIS USING R AND HADOOP 10

Features of R Language - HADOOP Features – HDFS and Map Reduce architecture – R and Hadoop Integrated Programming Environment- RHIPE Introduction – Architecture of RHIPE – RHIPE function reference. RHADOOP Introduction – Architecture of RHADOOP – RHADOOP function reference, SQL on HADOOP.

UNIT III ANALYTICS FOR BIG DATA STREAMS 9

IBM Pure Data Systems – Netezza's Design Principles – The Netezza Appliance – Extending the Netezza Analytics – Real-Time Analytical Processing – Info Sphere Streams Basics – InfoSphere Streams Working – enterprise class – industry use cases – Indexing Data from Multiple Sources – Creating Information Dashboards

UNIT IV PROGRAMMING WITH PIG 9

Introduction – installation and execution – PIG Data Model – PIG Latin – Input, Output- Relational Operators – User Defined Functions – Join Implementations – Integrating Pig with Legacy Code and Map Reduce –Developing and Testing Pig Latin Scripts – Embedding Pig Latin in Python – Evaluation Function in Java- Load Functions – Store Functions.

UNIT V PROGRAMMING WITH HIVE 8

Introduction – Data Types and File Formats – Databases in Hive – HiveQL: Data Definition – Data Manipulation – Queries – Views – Indexes – Schema Design.

TOTAL=45Hrs

TEXT BOOKS/REFERENCES:

1. Norman Matloff , "The Art of R Programming: A Tour of Statistical Software Design", NoStarch Press, 2011.
2. Prajapati, V, "Big Data Analytics with R and Hadoop", Packt Publishing Ltd, 2013.
3. Tom White "Hadoop: The Definitive Guide" Third Edition, O"reilly Media, 2011.

REFERENCES BOOKS:

1. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
2. Zikopoulos, P., Parasuraman, K., Deutsch, T., Giles, J., & Corrigan, D.V Harness the Power of Big Data the IBM Big Data Platform. McGraw Hill Professional, 2012.
3. Gates, A. Programming Pig." O'Reilly Media, Inc.", 2011.
4. Capriolo, E., Wampler, D., &Rutherglen, J., "Programming Hive", O'Reilly Media, Inc.",2012
5. Jared P. Lander, "R for Everyone: Advanced Analytics and Graphics", Addison-Wesley Data & Analytics Series, 2013.

CO-PO Mapping:

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

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

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

L	T	P	C
3	0	0	3

20ACS29 - DATA WAREHOUSING AND DATA MINING
(Professional Elective -II)

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. Create association rule for mining the data in real time.
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

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

UNIT-II

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

UNIT-III

Classification and Prediction: Issues Regarding Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners –

Other Classification Methods – Prediction – Accuracy and Error Measures – Evaluating the Accuracy of a Classifier or Predictor – Ensemble Methods – Model Section.

UNIT-IV

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

UNIT-V

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

TEXT BOOKS

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

REFERENCE BOOKS

1. Alex Berson and Stephen J. Smith "Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill Edition, Tenth Reprint 2007.
2. K.P. Soman, Shyam Diwakar and V. Ajay "Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.
3. G. K. Gupta "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.
4. Pang,Ning Tan, Michael Steinbach and Vipin Kumar "Introduction to Data Mining", Pearson Education, 2007.

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	-	3	-	-	-	-	-	-	-	3	3
CO3	3	-	-	3	-	-	-	-	-	-	-	-	2	3
CO4	-	-	3	3	3	-	-	-	-	-	-	-	3	2
CO5				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 (Common to IT and CSE[DS], CSE[AIML]

L	T	P	C
3	0	0	3

20AIT13 - SOFTWARE PROJECT MANAGEMENT
Professional Elective Courses-II

COURSE OUTCOMES:

CO1: Implement a project to manage project schedule, expenses and resources of application.

CO2: Obtain adequate knowledge about software process models and software effort estimation techniques.

CO3: Design and develop project plans to address real-world management challenges.

CO4: Aware of project management theories, tools, techniques and methods to manage the software projects at each stage of software development life cycle.

CO5: Understand modern software project management principles as a member and leader in a team to manage the projects.

UNIT I INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT

Manage your people – Managing project culture – Managing good people – Making good people-better – Leading good people – Implement your process – Putting a process in implementing a process – Adopting an agile process – Assessing a process – Leverage your tools – Choosing tools –Training to use tools – Leveraging tools – Use your measurements – Selecting measurements –Planning measurement – Leveraging measurement.

UNIT II PROJECT LIFE CYCLE ANDEFFORTESTIMATION

Software process and Process Models – Choice of Process models - Rapid Application development – Agile methods – Dynamic System Development Method – Extreme Programming– Managing interactive processes – Basics of Software estimation – Effort and Cost estimation techniques – COSMIC Full function points - COCOMO II - a Parametric Productivity Model.

UNIT III ARTIFACTS OF THE PROCESS AND MODEL BASED SOFTWAREARCHITECTURES

The artifact sets - Management artifacts - Engineering artifacts - Programmatic artifacts – Model based software architectures - A management perspective and technical perspective - Workflows of the process - Software process workflows - Iteration workflows – Check points of the process – Major milestones - Minor milestones - Periodic status assessments.

UNIT IV ITERATIVE PROCESS PLANNING- PROJECT ORGANIZATIONS AND RESPONSIBILITIES

Work breaks down structures - Planning guidelines – The cost and schedule estimating process – The iteration planning process - Pragmatic planning -Line of business organizations - Project organizations – Evolution of organizations – Process Automation-Automation building blocks-The project environment.

UNIT V PROJECT CONTROL AND PROCESSINSTRUMENTATION

The seven-core metrics - Management indicators - Quality indicators - Life cycle expectations - pragmatic software metrics - Metrics automation - Tailoring the process - Process Discriminates-Example.

TEXT BOOKS:

1. Software Project Management, 1/e, Walker Rayce, 1998, PEA, NewDelhi.
2. Software Project Management, 2/e, Henrey, 2009, Pearson Education, NewDelhi.

REFERENCE BOOKS:

1. Software Engineering Project Management, 2/e, Richard H. Thayer,1997, IEEE Computer Society, US.
2. Software Engineering and Management, 2/e, Shere K. D 1998, PHI, NewDelhi.
3. Software Project Management: A Concise Study, 2/e, S. A. Kelkar ,2009, PHI, NewDelhi.
4. Software Project Management, 5/e, Hughes Cotterell, 2011, TMH,India.
5. Software Project Management, 1/e, Mohapatra S 2011, Penguin Books Ltd, London,UK.

CO-PO Mapping

PO / CO	PO1	PO2	PO 3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	-	-	-	-	-	-	-	-	2	2
CO2	3	3	-	-	-	-	-	-	-	-	-	-	2	3
CO3	3	3	3	-	-	-	-	-	-	-	-	-	2	3
CO4	3	3	3	3	2	-	-	-	-	-	-	-	3	2
CO5	2	2	-	-	-	-	-	-	-	-	-	-	2	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B. TECH II-SEMESTER CSE[DS]

L	T	P	C
3	0	0	3

20ACD14 - DATA COMPRESSION TECHNIQUES
(Professional Elective - II)

COURSE OUTCOMES

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

1. Explain preliminaries of Loss less compression techniques, models and coding.
2. Analyze various Image compression and dictionary-based techniques like static Dictionary, Diagram Coding, Adaptive Dictionary
3. Apply understand the statistical basis and performance metrics for lossless compression
4. Apply the conceptual basis for commonly used lossless compression techniques.

UNIT I: BASICS OF COMPRESSION TECHNIQUES 9

Loss less compression, Lossy Compression, Measures of performance, Modeling and coding, Mathematical Preliminaries for Loss-less compression: A brief introduction to information theory, Models: Physical models, Probability models, Markov models, com-posite source model, Coding: uniquely decodable codes, Prefix codes.

UNIT II: THE HUFFMAN CODING ALGORITHM 9

Minimum variance Huffman codes, Adaptive Huffman coding: Update procedure, Encoding procedure, Decoding procedure. Golomb codes, Rice codes, Tunstall codes, Applications of Hoffman coding: Loss less image compression, Text compression, Audio Compression.

UNIT III: CODING APPROACHES 11

Coding a sequence, Generating a binary code, Comparison of Binary and Huffman coding, Applications: Bi-level image compression- The JBIG standard, JBIG2, Image compression. Dictionary Techniques: Introduction, Static Dictionary: Diagram Coding, Adaptive Dictionary. The LZ77 Approach, The LZ78 Approach, Applications: File Compression-UNIX compress, Image Compression: The Graphics Interchange Format (GIF), Compression over Modems: V.42 bits, Predictive Coding: Prediction with Partial match (ppm): The basic algorithm, The ESCAPE SYMBOL, length of context, The Exclusion Principle.

UNIT IV: SCALAR QUANTIZATION 8

Distortion criteria, Models, Scalar Quantization: The Quantization problem, Uniform Quantizer, Adaptive Quantization, non-uniform Quantization.

UNIT V: VECTOR QUANTIZATION 8

Introduction to Vector Quantization, Advantages of Vector Quantization over Scalar Quantization, The Linde-Buzo-Gray Algorithm.

Total=45Hrs

TEXT BOOKS

1. Nelson M, Gailly JL. The data compression book 2nd edition. M & T Books, New York, NY. 1995.
2. Salomon, David. Data compression: the complete reference. Springer Science & Business Media, 2004.

REFERENCE BOOKS

1. Sayood, Khalid. Introduction to data compression. Morgan Kaufmann, 2017.
2. McAnlis, Colt, and Aleks Haecky. Understanding compression: Data compression for modern developers. " O'Reilly Media, Inc.", 2016.

CO-PO Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. TECH II-SEMESTER (Common CSE[DS] and CSE[AIML])

L	T	P	C
3	0	0	3

20ACD15 - KNOWLEDGE MANAGEMENT

(Professional Elective - II)

COURSE OUTCOMES

On completion of the course the student will be able to

1. Explain the concept of knowledge and its types.
2. Identify the challenges in building Knowledge Management systems.
3. Apply Knowledge capturing techniques and coding tools for development of knowledge systems.
4. Analyze the Knowledge transfer methods and management protocols.

UNIT 1 KNOWLEDGE MANAGEMENT 9

KM Myths – KM Life Cycle – Understanding Knowledge – Knowledge, intelligence – Experience – Common Sense – Cognition and KM – Types of Knowledge – Expert Knowledge – Human Thinking and Learning.

UNIT 2 KNOWLEDGE MANAGEMENT SYSTEM LIFE CYCLE 9

Challenges in Building KM Systems – Conventional Vrs KM System Life Cycle (KMSLS) – Knowledge Creation and Knowledge Architecture – Nonaka's Model of Knowledge Creation and Transformation. Knowledge Architecture.

UNIT 3 CAPTURING KNOWLEDGE 9

Evaluating the Expert – Developing a Relationship with Experts – Fuzzy Reasoning and the Quality of Knowledge – Knowledge Capturing Techniques, Brain Storming – Protocol Analysis – Consensus Decision Making – Repertory Grid-Concept Mapping–Blackboarding.

UNIT 4 KNOWLEDGE CODIFICATION 9

Modes of Knowledge Conversion – Codification Tools and Procedures – Knowledge Developer's Skill Sets – System Testing and Deployment – Knowledge Testing –Approaches to Logical Testing, User AcceptanceTesting–KMSystemDeploymentIssues–UserTraining–Postimplementation.

UNIT 5 KNOWLEDGE TRANSFER AND SHARING 9

Transfer Methods – Role of the Internet – Knowledge Transfer in e- world – KM System Tools – Neural Network – Association Rules – Classification Trees – Data Mining and Business Intelligence – Decision Making Architecture – Data Management – Knowledge Management Protocols – Managing Knowledge Workers.

Total- 45 Hrs.

TEXT BOOKS

1. Elias.M. Award & Hassan M. Ghaziri – "Knowledge Management" Pearson Education 2000
2. Guus Schreiber, Hans Akkermans, AnjoAnjewierden, Robert de Hoog, Nigel Shadbolt, Walter Van de Velde and Bob Wielinga, "Knowledge Engineering and Management", Universities Press, 2001.

REFERENCE BOOKS

1. C.W. Holsapple, "Handbooks on Knowledge Management", International Handbooks on Information Systems, Vol 1 and 2, 2003
2. Becerra-Fernandez, I.; Sabherwal, R.: Knowledge Management: Systems and Processes. M.E. Sharpe Inc.,2010.

CO-PO Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. TECH II-SEMESTER CSE[DS]
III B. TECH II-SEMESTER CSE (Minor in Data science)

L	T	P	C
3	0	0	3

20ACD16 - DATA CENTRE AND NETWORKING TECHNOLOGIES

(Professional Elective Course-II)

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 **9hrs**

Design for flexibility, scalability, environmental control, electrical power, flooring, fire protection, security, network infrastructure. Energy use and greenhouse gas emissions. Requirements for modern data centres, high availability and Service Orientated Infrastructures (SOI). Modern data centre use case studies.

UNIT II - DATA CENTRE ARCHITECTURES **9hrs**

Network connectivity optimization evolution: Top of rack (TOR), end of rack (EOR), scale up vs scale up, solutions that reduce power and cabling. Data Centre standards; TIA/EIA-942. Structured cabling standards, fibre and copper cabling characteristics, cable management, bandwidth requirements, I/O connectivity.

UNIT III - SERVER ARCHITECTURES **9hrs**

Stand-alone, blades, stateless, clustering, scaling, optimization, virtualization. Limitation of traditional server deployments; modern solutions. Applications; database, finance etc. Redundant Layer 2 and Layer 3 designs. Case studies.

UNIT IV - LAYER 2 NETWORKS **9hrs**

Ethernet; IEEE 802.3ba; 40 Gbps and 100 Gbps Ethernet. IEEE 802.1D Spanning Tree Protocol (STP), RSTP, PVST, MSTP. TRILL (Transparent Interconnection of Lots of Links), RBridges, IEEE 802.1Qbg Edge Virtual Bridging, 802.1Qbh Bridge Port Extension. Fibre Channel over Ethernet (FCoE) vs Internet Small Computer System Interface (iSCSI). Data Center Bridging (DCB); priority-based flow control, congestion notification, enhanced transmission selection, Data Center Bridging Exchange (DCBX). Layer 2 Multicasting; Case studies.

UNIT V - LAYER 3 AND BEYOND **9hrs**

Layer 3 Data Centre technologies, network virtualization. Protocols; IPv4, IPv6, MPLS, OSPF, IS-IS, BGP. OTV, VPLS layer 2 extension protocols. Locator Identifier Separation Protocol

(LISP). Layer 3 Multicasting. Data centre application services. Data centre networking use case studies and the enabling technologies and protocols in the modern data centre.

TOTAL=45Hrs

TEXT BOOKS

1. SilvanoGai, Claudio DeSanti,"I/O Consolidation in the Data Center" Cisco Press; 1st edition [ISBN: 9781587058882]. 2009.
2. Kevin Corbin, Ron Fuller, David Jansen, "NX-OS and Cisco Nexus Switching: Next-Generation Data Center Architectures" Cisco Press; 1 edition [ISBN: 9781587058929], 2010.
3. SilvanoGai, TommiSalli, Roger Andersson, "Cisco Unified Computing System", Cisco Press; 1st edition, [ISBN: 9781587141935], 2010.

REFERENCE BOOKS

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	3
C02	3	3	2	-	-	-	-	-	-	-	-	-	3	2
C03	3	2	2	-	-	-	-	-	-	-	-	-	3	2
C04	2	2	2	-	-	-	-	-	-	-	-	-	2	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. TECH II-SEMESTER

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

L	T	P	C
3	0	0	3

20AEC45 - MICROPROCESSORS AND INTERFACING

(Open Elective – II)

Course Outcomes:

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

CO1: Understand the architecture of microprocessors
CO2: Write the Various ALP's of microprocessors
CO3: Design Interfacing of different external peripheral devices with microprocessors and micro controllers
CO4: Develop VLSI, Embedded systems, Industrial and real time application.

UNIT I 8086 MICROPROCESSORS

Evolution of microprocessors, memory segmentation,8086 Architecture, register organization, Flag Register, Pin Diagram of 8086- Minimum and Maximum mode 8086 systems, Timing Diagrams for Memory Read (MR), Memory Write (MW), IO Read (IOR) and IO Write (IOW) bus cycles.

UNIT II INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMING OF 8086

Addressing Modes-Instruction Set, Assembler Directives-Macros and procedures, assembly language programs for addition, subtraction, multiplication, division, GCD and LCM of two numbers, Evaluation of arithmetic expressions, largest and smallest numbers in an array, sorting an array, searching for a number in an array, programs using lookup tables.

UNIT-III INTERFACING WITH ADVANCED DEVICES

8086 System bus structure, Memory and I/O Interfacing with 8086, Interfacing through various IC Peripheral Chips, 8257 (DMA Controller), 8259 (Interrupt Priority Control).

INTERFACING I/O PORTS AND APPLICATIONS

Keyboard display controller (8279) and interfacing to 8086,PPI 8255 – various modes of operation and interfacing to 8086, Stepper Motor interfacing, D/A &A/D converter, traffic light controller

UNIT-IV ADVANCED MICROPROCESSORS

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

UNIT V INTRODUCTION TO MICROCONTROLLERS

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO 4	PO5	PO6	PO 7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO1	PSO2
CO1	3	3	3									3	3	3
CO2	3	3	3	3								3	3	3
CO3	3	3	3	3								3	3	3
CO4	3	3	3	3	3							3	3	3

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[AIML], CE, ME & IT)

L	T	P	C
3	0	0	3

20AME31 - OPERATION RESEARCH
(Open Elective – II)

Course Outcome:

Upon successful 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.
5. Develop a team and play a key role in decision making with interpretation skills for all round development of organization

UNIT: I INTRODUCTION AND LINER PROGRAMMING 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 – un balanced 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.

TEXT BOOKS

1. Taha, Introduction to Operations Research, New Delhi, 8th Edition, Printice Hall International Publisher, 2016.
2. A.M. Natarajan, P. Blalsubramani & A Tamilarasi, Operatiaons Research, New Delhi. 1st Edition, Pearson Piblishers, 2005.

REFERENCE BOOKS

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

Mapping of COs with POs & PSOs

	PO1	PO2	PO 3	PO4	PO5	PO 6	PO7	PO8	PO9	PO10	PO 11	PO 12	PSO1	PSO2
CO1	3	3											3	
CO2	3	3											3	2
CO3	3	3	3										3	
CO4	3	3		3									3	1
CO5	3	3											3	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. TECH II-SEMESTER

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

L	T	P	C
3	0	0	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 the purposes of product and technology development.
3. Formulate designs, patent and copyright for their innovative research works.
4. Apply intellectual property law principles of Trademarks to real problems.
5. Examine ethical and professional issues which arise in the intellectual property law context.

UNIT - I: UNDERSTANDING AND OVERVIEW OF IPR

Introduction- meaning- nature- forms of intellectual property- types of intellectual property-industry property-International conventions.

UNIT-II: COPYRIGHT ACT, 1957

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

UNIT-III: TRADEMARKS ACT, 1999

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

UNIT-IV: PATENT ACT, 1970

Meaning –definition of patent-history and concept of patent law-salient features of the patent act-Definition-kinds of patents and advantages-rights and obligations of patentee- Process of obtaining a patent.

UNIT-V: DESIGNS ACT, 2000

Meaning –definition- Salient features of Designs-Registration of Designs-Rights granted to design holders -Infringement of Design.

TEXT BOOKS

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

REFERENCES

1. Bouchoux, E.B. Intellectual Property Rights, Cengage Learning.
2. Ganguli, P. Intellectual Property Rights– Unleash my knowledge, Economy. Tata McGraw Hill Publishing Company Ltd.
3. Wadhera, B.L. Intellectual Property Law, Universal Publishers.

Mapping of COs with POs & PSOs

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

L	T	P	C
3	0	0	3

20ACD17 - BUSINESS ANALYTICS
(Job Oriented Elective -II)

COURSE OUTCOMES:

1. Explain the real-world business problems and model with analytical solutions.
2. Identify the business processes for extracting Business Intelligence
3. Apply predictive analytics for business fore-casting
4. Apply analytics for supply chain and logistics management
5. Use analytics for marketing and sales.

UNIT I INTRODUCTION TO BUSINESS ANALYTICS 9

Analytics and Data Science – Analytics Life Cycle – Types of Analytics – Business Problem Definition – Data Collection – Data Preparation – Hypothesis Generation – Modeling – Validation and Evaluation – Interpretation – Deployment and Iteration

UNIT II BUSINESS INTELLIGENCE 9

Data Warehouses and Data Mart - Knowledge Management – Types of Decisions - Decision Making Process - Decision Support Systems – Business Intelligence – OLAP.

UNIT III BUSINESS FORECASTING 9

Introduction to Business Forecasting and Predictive analytics - Logic and Data Driven Models – Data Mining and Predictive Analysis Modeling – Machine Learning for Predictive analytics.

UNIT IV HR & SUPPLY CHAIN ANALYTICS 9

Human Resources – Planning and Recruitment – Training and Development - Supply chain network - Planning Demand, Inventory and Supply – Logistics.

UNIT V MARKETING & SALES ANALYTICS 9

Marketing Strategy, Marketing Mix, Customer Behavior – selling Process – Sales Planning – Analytics applications in Marketing and Sales.

TOTAL=45Hrs

TEXT BOOKS

1. R. Evans James, Business Analytics, 2017
2. R N Prasad, Seema Acharya, Fundamentals of Business Analytics, 2016
3. Philip Kotler and Kevin Keller, Marketing Management, 15th edition, PHI, 2016

REFERENCE BOOKS

1. VSP RAO, Human Resource Management, 3rd Edition, Excel Books, 2010.
2. Mahadevan B, "Operations Management -Theory and Practice",3rd Edition, Pearson Education, 2018.

CO Mapping

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B. TECH II-SEMESTER CSE[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
(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
Introduction-Simple Linear Regression-Least Squared Method- Model Fitness and R-squared - Coefficient Significance and Test Error

UNIT II MULTILINEAR REGRESSION 8
Linear Regression with Higher-Order Terms: Polynomial Regression-Bias-Variance Trade-Off Linear Regression with Multiple Features-Feature Selection, Correlation, and Interaction.

UNIT III LOGISTIC REGRESSION 8
Logistic Regression Introduction-Logistic Regression Optimization-Performance Metrics in Classification-Sklearn Library Usage and Examples.

UNIT IV NON-PARAMETRIC MODELS 9
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 10
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://www.coursera.org/learn/introduction-to-machine-learning-supervised-learning
2. https://machinelearningmastery.com/stacking-ensemble-machine-learning-with-python/

CO Mapping

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

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

(Autonomous)
III B. Tech II Semester (Common to CSE (DS) and CSE[AIML])

L	T	P	C
0	0	3	1.5

20ACD19 - BIG DATA ANALYTICS WITH HADOOP AND SPARK LAB

Course Outcome

1. Explain the basic programming constructs of Hadoop and HDFS.
2. Solve Big data problems using Map Reduce Technique in HADOOP.
3. Apply Map Reduce programs for Query processing using Hive.
4. Apply analytics on big data streams using Hadoop Streaming API.

Task 1:

a) Understanding the Hortonworks Sandbox for Hadoop.
b) Installing Hortonworks Sandbox – Sun virtual box/VMware Player on Windows

Task 2:

Understanding and working with basic HDFS operations such as:

- Starting HDFS services,
- Listing files in HDFS.
- Adding files and directories.
- Retrieving files.
- Deleting files.
- Shutting down the HDFS services.

Task 3:

Understanding and Working with Ambari for provision, manage and monitor a Hadoop cluster, and also to integrate Hadoop with the existing enterprise infrastructure.

Task 4:

Write a java map-reduce program for counting the number of occurrences of each word in a text file.

Task 5:

Write a java map-reduce program for mining healthcare data and perform various analysis on healthcare dataset.

Task 6:

Working with HBase:

- Creating, Disabling, Enabling, Describing, Exists, Drop a Table, etc., using HBase Shell

Task 7:

Working with HBase to perform following operation:

- Creating, Update, Read, Delete, Scan, Count and Truncate

Task 8: Installation of Apache PySpark and performing basic operations

Task 9: Develop PySpark program with attributes of SparkConf.

Task 10: Working with PySpark SQL and DataFrames.

Task 11: Working with Apache Spark Machine Learning API - MLlib.

CO-PO Mapping:

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

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

(AUTONOMOUS)
III B. TECH II-SEMESTER CSE[DS]

L	T	P	C
0	0	3	1.5

20ACD20 - DATA VISUALIZATION TECHNIQUES LAB

COURSE OUTCOMES

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

1. Identify and Transform data into visually appealing graphics
2. Use visualisation techniques and perform exploratory data analysis.
3. Create effective visual systems for efficient communication.
4. Evaluate the effectiveness of visualization designs
5. Apply vision and awareness information to determine alternatives to visualization design.

LIST OF EXPEERIMENTS

Creating Visual Representations using MS Excel, Power BI, D3 (Data Driven Documents)

1. Study various charts and usages. Prepare the report for the same.
2. Plotting the Graph: Bar chart, Pie Chart, Histogram etc.,
3. Load the data set (excel and .csv) into the software and find the central tendency of the different columns.
4. Draw line chart for the selected columns and report the understanding of the data.
5. Draw Box plot and report the Q1, Q2, Q3 ranges and identify the outliers.
6. Plot different charts and format the chart using colours, mentioning legends etc.,
7. Load data set and choose ant one of the numeric columns. Apply forecasting technique.
8. Create dynamic charts.
9. Implement filters.
10. Create an interactive dashboard for the given data set.
11. Create the dashboard and collate the different sheets.
12. Create story board and collate the dashboards.
13. repare, analyse and present geographic data.
14. Develop reactive webpages for narrative data storytelling.

Case Study:

- Students performance dashboards, Creating sales dashboard, social media usage dashboards

CO-PO Mapping:

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

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

(AUTONOMOUS)
III B. TECH II-SEMESTER CSE[DS]

L	T	P	C
0	0	3	1.5

20ACD21 - BIG DATA QUERY LANGUAGES LAB

COURSE OUTCOMES

On completion of the course the student will be able to

- Explain the basic programming constructs of R and RHADOOP
- Use RHADOOP platform to Solve Big Data problems.
- Develop Pig scripts for analyzing large semi-structured data.
- Implement HiveQL to Query processing in Apache Hive.
- Implement programs to transfer data from Hadoop and RDBMS

LIST OF EXPERIMENTS:

1. Perform descriptive and predictive analytics using "R programming"
2. MapReduce application for word counting on R HADOOP after successful installation of three R packages (rhdfs, rmr, and rhbase)
3. Implement data pipeline using Pig Interactive Shell Commands after successful "Pig" installation
4. Develop Pig Scripts and call UDF's to accomplish functionalities to meet the problem objectives
5. Embedding PIG Latin in Python
6. Log analysis using "Pig" on semi structured data
7. Perform query processing on data warehousing after successful installation of "Hive"
8. Perform Adhoc query on HDFS data using Hive Query Language (HQL)
9. Accomplish MapReduce Job by using Hadoop Streaming API
10. Working with HDFS and Sqoop.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	2	2	-	2	-	-	-	-	-	-	-	3	3
C02	3	3	2	-	2	-	-	-	-	-	-	-	3	3
C03	3	2	2	1	2	-	-	-	-	-	-	-	3	2
C04	3	2	2	1	2	-	-	-	-	-	-	-	3	2
CO5	3	2	1										-	-

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

(AUTONOMOUS)

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

L	T	P	C
1	0	2	2

20ACD22 - SHELL PROGRAMMING
(Skill Course)

Course outcome:

1. Explain the basics of UNIX architecture and different shell 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 system

Session-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 usetabs 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 morecommand to see the contents of myfile1.
e. Use the date and who commands in sequence (in one line) such that the output of datewill 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 the first character in each line in a file.
b. Write a sed command that deletes the character before the last character in each line ina file.
c. Write a sed command that swaps the first and second words in each line in a file.

Week-4

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

c) Write a shell script that determines the period for which a specified user is working on the system.

Week-6

a) Write a shell script that accepts a file name starting and ending line numbers asarguments 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 morefiles 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.

b) Write a shell script that accepts two integers as its arguments and computers

the value of first number raised to the power of the second number.

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.

c) Write a shell script which receives two file names as arguments. It should check whetherthe two file contents are same or not. If they are same then second file should be deleted.

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, PearsonEducation.
2. Advanced Unix programming, 2nd Edition, N.B Venkateswarlu, 2010, BS Publications.Unix Shell programming, 1st Edition, Yashwanth Kanitkar, 2010, BPB Publisher.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	-	-	-	-	-	-	-	-	-	3	3
CO2	3	3	2	-	2	-	-	-	-	-	-	-	3	3
CO3	3	3	2	1	2	-	-	-	-	-	-	2	3	2
CO4	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 - II Semester (Common to All Branches)

L	T	P	C
2	0	0	0

20AHS23 - ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE
(Mandatory Course)

Course Outcome:

Upon successful completion of the course the students 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 10

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 10

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 10

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 10

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 10

Traditional knowledge and engineering, Traditional medicine system, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK.

Text Book(s)

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

Reference Books

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

2. Knowledge Traditions and Practices of India" Kapil Kapoor, Michel Danino.

Web Links:

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

Mapping of COs with POs & PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	3	-	-	-	-	3	3	3					2	1
CO2	2	-	-	-	-	3	3	2					1	1
CO3	-	-	-	-	-	3	3	-					1	
CO4	3	-	-	-	-	3	3	3					1	

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B. TECH I-SEMESTER

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

L	T	P	C
3	0	0	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-Startup and Venture development-Pre-incubation and Incubation Stages-Govt. Schemes and funding support to ideas, innovations, and startup-Current trends, development and general awareness on Innovation and startup.

Text Books:

1. Kandwalla, P. N. (2004). Lifelong creativity: an unending quest. Tata Mcgraw-Hill..
2. Khandwalla, P. N. (2022). Corporate Creativity: The Winning Edge (1st ed.). Mc Graw Hill India.

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.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	3	3	3	-	-	-	-	-	-	-	-	2	2
CO 2	-	3	3	3	-	-	-	-	-	-	-	-	2	2
CO 3	-	-	3	-	-	3	3	-	-	-	-	-	2	1
CO 4	3	3	3	3	-	-	-	-	-	-	-	-	1	1
CO 5	-	-	3	-	3	-	-	-	-	-	-	-	1	1

Correlation Levels: 3 - High 2 - Medium 1 - Low

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	0	0	3

20AMB05 - LEADERSHIP ESSENTIALS

Course Outcomes:

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

1. Identify the concepts and theories of leadership and analyse its relevance to the organizations.
2. Analyze various sources of power, politics and conflict management.
3. Adapt theories of leadership to cases and contexts in organisation.
4. Interpret change, sustainable development and implications of cultural factors in organizations.
5. Develop leadership potential and practices in organizations.

Unit I- Overview and Introduction of Leadership: concepts and functions of leadership; Leadership, Role and Functions of a Leader, Leadership Motives Characteristics of an Effective Leader, Leadership as a Process - the Complexities of Leadership - Effective Leadership 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 leaders in organization.

Textbooks:

1. Peter Guy Northouse. (2021). Introduction to leadership: concepts and practice (5th ed.). Sage.
2. Humphrey, R. H. (2014). Effective leadership: theory, cases, and applications. Sage.

References Books:

1. Bratton, J., Grint, K., & Nelson, D. L. (2005). Organizational leadership. Thomson/South-Western.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	-	-	-	-	-	-	-	-	-	-	-	-	2	2
CO 2	-	-	-	-	-	-	-	-	3	-	-	-	2	1
CO 3	-	-	-	-	-	-	-	-	3	-	-	-	2	2
CO 4	-	-	-	-	-	3	3	-	3	3	-	-	1	1
CO 5	-	-	-	-	-	-	-	-	3	3	-	-	1	1

Correlation Levels: 3 - High 2 - Medium 1 - Low

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	0	0	3

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 in different 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.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	-	3	3	-	-	-	-	-	-	-	-	-	2	1
CO 2	-	3	3	-	-	-	-	-	-	-	-	-	1	-
CO 3	-	3	3	-	-	-	-	-	-	-	-	-	1	1
CO 4	-	3	3	-	-	-	-	-	-	-	-	-	1	1
CO 5	-	3	3	-	-	-	-	-	-	-	-	-	-	-

Correlation Levels: 3 - High 2 - Medium 1 - Low

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	0	0	3

20AMB07 - ENTREPRENEURSHIP ESSENTIALS

COURSE OUTCOMES

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

1. Explain the Fundamentals and specifics of Entrepreneurship.
2. Apply theoretical concepts in developing an idea and startup a new technology-based company.
3. Prepare marketing and financial plans that are viable in nature.
4 Apply marketing research methods and tools to forecast and to analyze the trend.
5. Develop innovative business solutions with a holistic perspective from concept to reality.

UNIT-I: BASIC ENTREPRENEURSHIP: Entrepreneurial traits, true motivation & leadership, understanding of Entrepreneurial process, understanding of personal aspirations, Entrepreneurial personality development, Entrepreneurial communication, Entrepreneurship in Indian Scenario, Future prospects in India and emerging economies.

UNIT-II: MARKETING AND MARKET RESEARCH: Market dynamics, Market segmentations and creation of derivatives, Marketing Research methodologies, trend, assessment, analysis and forecasting, structural aspects of market. Identification of overall market, addressable market and serviceable market for product and services.

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

UNIT – IV: FINANCIAL AND LEGAL ASPECTS OF BUSINESS: Process for effective financial planning, types of budgets preparation, overview of specific ratios to measure financial performance, liquidity, asset management, profitability, leverage and comparative analysis, business laws enshrined in the Indian constitution, the policies of the state, Income tax structure, the labor laws.

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

TEXT BOOKS:

1. Allen, K. R. (2018). Launching New Ventures: An Entrepreneurial Approach. United States: Cengage Learning.
2. Khanka, S. S. (2006). Entrepreneurial Development. India: S. Chand Limited.
3. Nelson, A. J., Byers, T. H., Dorf, R. C. (2018). Technology Ventures: From Idea to Enterprise. United Kingdom: McGraw-Hill Education.

REFERENCES:

1. Harrington, H. J. (2018). Creativity, Innovation, and Entrepreneurship: The Only Way to Renew Your Organization. United States: Taylor & Francis.
2. Smith, A., Pigneur, Y., Papadakos, T., Osterwalder, A., Bernarda, G. (2015). Value Proposition Design: How to Create Products and Services Customers Want. Germany: Wiley.
3. Allen, K. R. (2010). Entrepreneurship for Scientists and Engineers. United Kingdom: Pearson Prentice Hall.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	2	2	3	-	3	-	1	-	-	-	3	-	2	2
CO 2	-	2	3	-	3	-	-	-	-	-	3	-	2	2
CO 3	-	-	-	-	-	-	-	-	-	-	3	-	1	1
CO 4	-	2	3	-	-	-	-	-	-	-	-	-	1	1
CO 5	2	-	3	-	-	-	-	-	1	-	3	-	1	1

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

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	0	0	3

20AMB08 - ESSENTIALS OF MANAGEMENT SCIENCE

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, 4th Edition, 2009.
2. Stoner, Freeman, Gilbert, Management, Pearson Education, New Delhi, 6th Edition, 2004.
3. Panner Selvem, Production and Operations Management, Prentice Hall of India, 3rd Edition, 2012

Reference Books:

1. Kotler Philip & Keller Kevin Lane, Marketing Management, PHI, 12th Edition, 2005.
2. Koontz & Weihrich, Essentials of Management, TMH, 6th Edition, 2005.
3. SubbaRao. P, Personnel and Human Resource Management, Himalaya Publishing House, 2000

CO-PO MAPPING:

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

Correlation Levels: 3 - High 2 - Medium 1 - Low

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	0	3

20AIT20 - SOFTWARE TESTING
(Professional Elective -III)

COURSE OUTCOMES

CO1: Design test cases suitable for a software development for different domains.
CO2: Identify suitable tests to be carried out.
CO3: Prepare test planning based on the document.
CO4: Document test plans and test cases designed.
CO5: Use automatic testing tools and develop and validate a test plan.

UNIT-I INTRODUCTION

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

UNIT - II TEST CASE DESIGN STRATEGIES

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

UNIT - III LEVELS OF TESTING

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

UNIT - IV TEST MANAGEMENT

People and organizational issues in testing – Organization structures for testing teams – testing services – Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process – Reporting Test Results – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group- The Structure of Testing Group. The Technical Training Program.

UNIT - V TEST AUTOMATION

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

TEXT BOOKS

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

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

REFERENCES

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

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

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

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

CO-PO MAPPING:

PO / CO	PO 1	PO 2	PO 3		PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
CO1	3	2	-		-	3	-	-	-	-	-	-	-	1	2
CO2	2	3	3		-	2	-	-	-	-	-	-	-	2	1
CO3	2	3	3		-	3	-	-	-	-	-	-	-	3	2
CO4	2	3	3		-	2	-	-	-	-	-	-	-	2	1
CO5	3	3	-		2	3	-	-	-	-	-	-	-	1	2

Correlation Levels: 3 - High 2 - Medium 1 - Low

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

IV B. Tech I Semester

(Common To CSE, CSE (DS), CSE (AI&ML) & IT – Professional Elective – III)

IV B. Tech I Semester ECE (Open Elective-III)

L	T	P	C
3	0	0	3

20ACS39 CLOUD COMPUTING
(Professional Elective - 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, Why Clouds? What is a Cloud?, History, What's New in Today's Clouds, Introduction to Clouds: New Aspects of Clouds, Introduction to Clouds: Economics of Clouds, A cloud IS a distributed system, What is a 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, What is Group Membership List?, Failure Detectors, Gossip-Style Membership, Which is the best failure detector?, Another Probabilistic Failure Detector, Dissemination and suspicion, Grid Applications, Grid Infrastucture

P2P Systems: Introduction, Napster, Gnutella, FastTrack and BitTorrent, 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: What is 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 and Wrap-Up.

UNIT IV

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

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, What Causes 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

CO-PO MAPPING:

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

L	T	P	C
3	0	0	3

20ACD23 - LINKED OPEN DATA AND ITS APPLICATIONS
(Professional Elective -III)

COURSE OUTCOME

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

1. Explain the computational aspects of creation, storage & retrieval of Linked Open Data (LOD).
2. Identify the need of RDF & SPARQL in querying LOD.
3. Use published linked data, patterns and Data architecture in the Web.
4. Apply recommendation systems for content-based recommendations and Collaborative Filtering.
5. Analyze machine learning algorithms for large scale Linked open data applications.

UNIT I INTRODUCTION 9

Introduction–Principles of Linked Data– URIs, RDF data model, RDF Serialization, Relationship links, Identity links, Vocabulary Links– Linked Data Design Considerations– Web of Data– Bootstrapping – Topology

UNIT II RDF & SPARQL 9

RDF database systems–RDF and Semantic Web – Encoding, storage, indexing – Query processing – reasoning– SPARQL– Improving Linked Data quality

UNIT III PUBLISHING & CONSUMING LINKED OPEN DATA 9

Publishing Linked Data – Publishing patterns – Recipes for publishing – Consuming Linked– Data Querying Linked Data Architecture of Linked Data Applications - Advertising on the web: Issues in Online Advertising - Online Algorithms - The Matching Problem

UNIT IV RECOMMENDATION SYSTEMS 9

Recommendation systems: A Model for Recommendation Systems, Content-Based Recommendations, Collaborative Filtering, Dimensionality Reduction

UNIT V LARGE SCALE MACHINE LEARNING 9

Mining social network graphs – Social Networks as Graphs, Clustering of Social-Network Graphs, Discovery of Communities, Partitioning of Graphs, Overlapping Communities, Simrank, Counting Triangles, Large scale machine learning– Machine-Learning Model, Perceptrons, SVM, Learning from Nearest Neighbours

TOTAL=45Hrs

TEXT BOOKS

1. Tom Heath, Christian Bizer, “Linked Data: Evolving the Web into a Global Data Space”, Morgan & Claypool Publishers, 2011.
2. David Wood, “Linking Government Data”, Springer Science & Business Media, 2011.

REFERENCES

1. Jure Leskovec, AnandRajaraman, Jeffrey David Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2014.
2. Olivier Curé, Guillaume Blin, “RDF Database Systems: Triples Storage and SPARQL Query Processing”, Morgan Kaufmann, 2014.
3. Bob DuCharme, “Learning SPARQL”, "O'Reilly Media, Inc.", 2011.

CO-PO Mapping:

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

L	T	P	C
3	0	0	3

20ACD24 - DATA INTENSIVE COMPUTING
(Professional Elective -III)

COURSE OUTCOME

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

- Explain the characteristics of various database systems.
- Identify High performance Network architectures and Systems for Data Intensive Computing.
- Apply Ensemble learning techniques for Data intensive computing applications.
- Analyze the security requirements and applications of Data Intensive Computing.

UNIT I INTRODUCTION **9**

Introduction to Distributed systems – Databases Vs. File Systems - Distributed file systems (HDFS) – Distributed Machine-Learning System - Data Parallelism – Characteristics -Hadoop –Execution Engines -Map Reduce- Distributed Storage System for Structured Data – NoSQL databases - Casandra, Mongo DB-Developing a Distributed Application

UNIT II ARCHITECTURES AND SYSTEMS **9**

High performance Network Architectures for Data intensive Computing – Architecting Data Intensive Software systems – ECL/HPCC: A Unified approach to Big Data – Scalable storage for Data Intensive Computing - Computation and Storage of scientific data sets in cloud- Stream Data Model - Architecture for Data Stream Management-Stream Queries –Sampling Data in a Stream Filtering Streams

UNIT III TECHNOLOGIES AND TECHNIQUES **9**

Load balancing techniques for Data Intensive computing – Resource Management for Data Intensive Clouds – SALT - Parallel Processing, Multiprocessors and Virtualization in Data intensive Computing - Challenges in Data Intensive Analysis and Visualization - Large-Scale Data Analytics Using Ensemble Clustering - Ensemble Feature Ranking Methods for Data Intensive Computing Application - Record Linkage Methodology and Applications- Semantic Wrapper

UNIT IV SECURITY **9**

Security in Data Intensive Computing Systems - Data Security and Privacy in Data-Intensive Supercomputing Clusters - Information Security in Large Scale Distributed Systems -Privacy and Security Requirements of Data Intensive Applications in Clouds

UNIT V APPLICATIONS AND FUTURE TRENDS **9**

Cloud and Grid Computing for Data Intensive Applications -Scientific Applications - Bioinformatics Large Science Discoveries - Climate Change - Environment - Energy - Commercial Applications - Future trends in Data Intensive Computing

TEXT BOOKS:

1. Tom White, “Hadoop: The Definitive Guide”, O'Reilly Media. October 2010.2.
2. Furht, Borko, Escalante, Armando, “Handbook of Data Intensive Computing”, Springer 2011.

REFERENCES:

1. Magoules, Frederic, Jie Pan, and Fei Teng. Cloud computing: Data-intensive computing and scheduling. CRC press, 2012.
2. Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer Widom., "Database Systems: The Complete Book", Pearson, 2013.

CO-PO Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B. TECH I-SEMESTER CSE[DS]

L	T	P	C
3	0	0	3

20ACD25 - IMAGE AND VIDEO ANALYTICS
(Professional Elective -III)

COURSE OUTCOMES

- Explain the concepts of Data Analysis and Modern Analytical Tools.
- Identify Data Stream Model and its Architecture for Real Time Analytics.
- Use Video surveillance for object detection and Tracking.
- Apply Behavioral Analysis for recognition of Human activity.
- Apply Recognition algorithms for Human Face recognition and Gai Analysis.

UNIT I INTRODUCTION TO DATA ANALYSIS 9

Introduction to Big Data Platform – Challenges of Conventional Systems – Web Data – Evolution of Analytic Scalability – Analytic Processes and Tools – Analysis Vs Reporting – Modern Data Analytic Tools – Data Analysis: Regression Modeling – Bayesian Modeling – Rule Induction.

UNIT II MINING DATA STREAMS 9

Introduction to Stream 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 – Real Time Analytics Platform (RTAP) Applications – Case Studies.

UNIT III VIDEO ANALYTICS 9

Introduction – Video Basics – Fundamentals for Video Surveillance – Scene Artifacts – Object Detection and Tracking: Adaptive Background Modelling and Subtraction – Pedestrian Detection and Tracking – Vehicle Detection and Tracking – Articulated Human Motion Tracking in Low Dimensional Latent Spaces.

UNIT IV BEHAVIOURAL ANALYSIS AND ACTIVITY RECOGNITION 9

Event Modelling – Behavioural Analysis – Human Activity Recognition – Complex Activity Recognition – Activity modeling using 3D shape - Video summarization – shape-based activity models – Suspicious Activity Detection.

UNIT V HUMAN FACE RECOGNITION AND GAIT ANALYSIS 9

Introduction: Overview of Recognition algorithms – Human Recognition using Face: - Face Recognition from still images – Face Recognition from video – Evaluation of Face Recognition Technologies – Human Recognition using gait: HMM Framework for Gait Recognition – View Invariant Gait Recognition – Role of Shape and Dynamics in Gait Recognition.

TOTAL=45Hrs

TEXT BOOKS/REFERENCES

1. Michael Berthold, David J.Hand, “Intelligent Data Analysis”, Springer, 2007.
2. Anand Rajaraman and Jeffrey David Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2012.
3. Yunqian Ma, Gang Qian, “Intelligent Video Surveillance: Systems and Technology”, CRC Press (Taylor and Francis Group), 2009.
4. Rama Chellappa, Amit K.Roy– Chowdhury, Kevin Zhou.S, “Recognition of Humans and their Activities using Video”, Morgan & Claypool Publishers, 2005.

CO-PO 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	3	2										2	3
CO4	3	3	2										2	1
CO5	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 (Common to CSE (DS), CSE (AI&ML) & IT)

L	T	P	C
3	0	0	3

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

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

CO1: Perform functional and nonfunctional tests in the life cycle of the software product.
CO2: Understand system testing and test execution process.
CO3: Identify defect prevention techniques and software quality assurance metrics.
CO4: Apply techniques of quality assurance for typical applications.

UNIT I SOFTWARE TESTING - CONCEPTS, ISSUES, AND TECHNIQUES

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

UNIT II SYSTEM TESTING

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

UNIT III SYSTEM TEST CATEGORIES

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

Test Generation from FSM models- State-Oriented Model. Finite-State Machine Transition Tour Method, Testing with State Verification. Test Architectures-Local, distributed, Coordinated, Remote. system test design- Test Design Factors Requirement Identification, modeling a Test Design Process Test Design Preparedness, Metrics, Test Case Design Effectiveness. system test execution- Modeling Defects, Metrics for Monitoring Test Execution. Defect Reports, Defect Causal Analysis, Beta testing, measuring Test Effectiveness.

UNIT IV SOFTWARE QUALITY

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

UNIT V SOFTWARE QUALITY ASSURANCE

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

Co-Po Mapping:

	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**
C0 1	3	3	2	3	2	-	-	-	-	-	-	-	3	2
C0 2	3	1	2	2	1	-	-	-	-	-	-	-	3	2
C0 3	2	2	2	3	1	-	-	-	-	-	-	-	2	1
C0 4	2	2	1	3	1	-	-	-	-	-	-	-	2	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B. TECH I-SEMESTER CSE[DS]

L	T	P	C
3	0	0	3

20ACD26 - SOCIAL MEDIA MINING
(Professional Elective -IV)

COURSE OUTCOMES:
CO1: Explain the basic concepts of social media mining and Graph theory applications.
CO2: Identify network models and linking behavior in the social media.
CO3: Apply community algorithms and evolution in the social media communities.
CO4: Apply diffusion models in social network for prediction.
CO5: Analyze the algorithms and methods for recommendation systems.

UNIT- I INTRODUCTION **9**

Social Media Mining - Introduction – Atoms – Molecules – Interactions – Social Media mining Challenges - Graphs - Basics – Nodes – Edges – Degree of Distribution- Types –Directed – Undirected – Weighted - Graph Connectivity - Tress and Forests – Bipartite graphs – Complete Graphs – Sub graphs – Planar Graphs - Graph Representation - Graph Traversal Algorithms – Shortest path algorithms Dijkstra's - Spanning tree algorithms – Prims - Bipartite matching - Ford-Fulkerson algorithm

UNIT- II NETWORK MODELS AND LINK ANALYSIS **9**

Network Models – Measures – Node: Eigen Centrality – Page Rank – Group Measures – Betweenness centrality - group degree centrality, centrality, and group - Closeness centrality - Node Linking Behavior - Transitivity and reciprocity - Linking Analysis - Cluster coefficient – Jaccard - Case Study : -Modelling small networks with real world model

UNIT-III SOCIAL MEDIA COMMUNITIES **9**

– Social Communities – Member based Detection – Node degree –Node Similarity – Node reachability - Group Based detection methods - balanced – robust -modular – dense - hierarchical - Spectral Clustering: Balanced Community algorithm- Community Evolution - Evaluation.

UNIT-IV SOCIAL NETWORK MODELS AND METHODS **9**

Social Network – Information Diffusion – Types - herd behavior - information cascades diffusion of innovation – epidemics – Diffusion Models Case Study – Herd Behavior – Information Cascades Methods – Social Similarity – assortativity – Social Forces – Influence homophily – Confounding - Assortativity measures – Influence measures – Predictive Models

UNIT-V RECOMMENDATION SYSTEMS **9**

Recommendation Vs Search – Recommendation Challenges – Recommender algorithms – Content Based Methods- Collaborative Filtering – Memory Based – Model Based – Social Media Recommendation – User friendship – Recommendation Evaluation – Precision – Recall – Behavioral– User Behavior – User – Community behavior – User Entity behavior – Behavioral Analytics - Methodology

TOTAL=45Hrs

TEXT BOOK:

1. Social Media Mining: An Introduction – Reza Zafarani , MohhammadAbiElasi – Published by Cambridge press, 2014.
2. Data Mining for Social Network Data- Memon, N., Xu, J.J., Hicks, D.L., Chen, H. (Eds.), Springer – Annals of Information Systems, ISBN 978-1-4419-6287-4

REFERENCES:

1. Mining the social web: data mining Facebook, Twitter, LinkedIn, Google+, GitHub, and more. Russell, Matthew, O'Reilly Media, Inc., 2013.
2. Social Media: A Critical Introduction, Christian Fuchs, SAGE Publications Ltd, 2013.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	3	3	2	-	-	-	-	-	-	-	-	3	3
CO2	3	2	3	-	-	-	-	-	-	-	-	3	2
CO3	3	3	3	-	-	-	-	-	-	-	-	3	2
CO4	3	2	3	-	-	-	-	-	-	-	-	3	3
CO5	3	2	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[DS]

L	T	P	C
3	0	0	3

20ACD27 - ETHICAL HACKING AND NETWORK DEFENCE
(Professional Elective -IV)

COURSE OUTCOMES:
Upon successful completion of this course, a student will be able to:

1. Explain the vulnerabilities and mechanisms to find threats and attacks.
2. Use port scanning tools for Network administration.
3. Apply hacking techniques on web applications and Session.
4. Analyze sniffing tools and DOS attacks on wireless networks.

UNIT I:
Introduction to ethical hacking. Fundamentals of computer networking. TCP/IP protocol stack, IP addressing and routing. Routing protocols.

UNIT II:
Introduction to network security. Information gathering: reconnaissance, scanning, etc. Vulnerability assessment: OpenVAS, Nessus, etc. System hacking: password cracking, penetration testing, etc.

UNIT III:
Social engineering attacks. Malware threats, penetration testing by creating backdoors, Introduction to cryptography, private-key encryption, public-key encryption. Key exchange protocols, cryptographic hash functions, applications.

UNIT IV:
Steganography, biometric authentication, lightweight cryptographic algorithms, Sniffing: Wireshark, ARP poisoning, DNS poisoning. Hacking wireless networks, Denial of service attacks.

UNIT V:
Elements of hardware security: side-channel attacks, physical unclonable functions, Hacking web applications: vulnerability assessment, SQL injection, cross-site scripting, Case studies: various attacks scenarios and their remedies

TOTAL=45Hrs

REFERENCES:

1. Kimberly Graves, "Certified Ethical Hacker", Wiley India Pvt Ltd, 2010
2. Michael T. Simpson, "Hands-on Ethical Hacking & Network Defense", Course Technology, 2010
3. Rajat Khare, "Network Seuciryt and Ethical Hacking", Luniver Press, 2006
4. Ramachandran V, BackTrack 5 Wireless Penetration Testing Beginner's Guide (3rd ed.). Packt Publishing, 2011
5. Thomas Mathew, "Ethical Hacking", OSB publishers, 2000.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	3	3	1									3	
CO2	3	2	1									3	2
CO3	3	3	2									2	3
CO4	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 CSE[DS]

L	T	P	C
3	0	0	3

20ACD28 - INFORMATION RETRIEVAL SYSTEM
(Professional Elective -IV)

COURSE OUTCOMES

On completion of the course, student will be able to.

- Explain the basic concepts and techniques in information retrieval.
- Describe the different data structures for efficient retrieval of information.
- Apply ontology languages for handling semantic web.
- Analyse web-based data mining techniques for developing recommendation systems

UNIT 1 INTRODUCTION TO INFORMATION RETRIEVAL 9

Basic Concepts of IR - Data Retrieval & Information Retrieval - IR system block diagram. Automatic Text Analysis: Luhn's ideas - Conflation Algorithm - Indexing and Index Term Weighing - Probabilistic Indexing - Automatic Classification. Measures of Association - Different Matching Coefficient - Classification Methods - Cluster Hypothesis - Clustering Algorithms - Single Pass Algorithm - Single Link Algorithm - Rocchio's Algorithm.

UNIT 2 STORAGE AND VECTOR MODEL SEARCHING STRATEGIES 9

Storage: Inverted file - Suffix trees & suffix arrays - Signature Files - Scatter storage or hash addressing - Clustered files. IR Models: Basic concepts - Boolean Model - Vector Model Searching strategies: Boolean Search - Serial search - cluster based retrieval - Query languages- Types of queries - Patterns matching - structural queries.

UNIT 3 ONTOLOGY 8

Performance evaluation: Precision and recall - alternative measures Ontology: Ontology based information sharing - Ontology languages for semantic web - Ontology creation.

UNIT 4 DISTRIBUTED AND MULTIMEDIA IR 9

Distributed IR: Introduction - Collection Partitioning - Source Selection - Query Processing - web issues. Multimedia IR: Introduction - Data Modeling - Query languages - Generic multimedia indexing approach - One dimensional time series - two-dimensional color images- Automatic feature extraction.

UNIT 5 WEB DATA MINING AND RECOMMENDATION 10

Searching the Web: Challenges - Characterizing the Web - Search Engines - Browsing - Meta-searchers - Web crawlers - Meta-crawler - Web data mining - Finding needle in the Haystack- Searching using Hyperlinks - Page ranking algorithms. Collaborative Filtering and Content Based Recommendation of Documents and Products - Information Extraction and Integration: Extracting Data from Text. Semantic Web - Collecting and Integrating Specialized Information on the web.

TOTAL = 45 Hrs

TEXT / REFERENCE BOOKS

1. Ricardo, Baeza-Yates. *Modern information retrieval*. Pearson Education India, 1999.
2. C.J. Rijsbergen - "Information Retrieval" - (www.dcs.gla.ac.uk).
3. Heiner Stuckenschmidt - Frank van Harmelen - “Information Sharing on the SemanticWeb” - Springer International.

CO-PO Mapping:

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

L	T	P	C
3	0	0	3

20ACD29- DATA PRIVACY
(Professional Elective -IV)

COURSE OUTCOMES

On completion of the course, student will be able to

- Explain the concepts of Data privacy, policies, laws and their specifications.
- Identify Data Explosion models for data sharing and risk measurements.
- Apply protection models and computation Systems for handling delimited data.
- Analyze the legal issues and technological policies for data privacy and its applications.

UNIT 1 INTRODUCTION 9

Fundamental Concepts -Data Privacy Definitions, Data Privacy vs Data Security, Statistics, Data Privacy Attacks, Data linking and profiling, access control models, role-based access control, Data privacy policies, laws and acts, their specifications, languages and implementation.

UNIT 2 DATA EXPLOSION 9

Statistics and Lack of barriers in Collection and Distribution of Person-specific information, Mathematical model for characterizing, comparing real-world, data sharing practices and policies computing privacy and risk measurements.

UNIT 3 PROTECTION MODELS 9

Protection Models- Null-map, k-map, Wrong map -Survey of techniques- Protection models (null-map, k-map, wrong map), Disclosure control, Inferring entity identities, Strength and weaknesses of techniques, entry specific databases

UNIT 4 COMPUTATION FOR PROTECTING DELIMITED DATA 9

Computation systems for protecting delimited data- MinGen, Datafly, Mu-Argus, k-Similar, Protecting textual documents- Scrub.

UNIT 5 TECHNOLOGY, POLICY, PRIVACY AND FREEDOM 9

Technology, Policy, Privacy and Freedom- Medical privacy legislation, policies and best practices, Examination of privacy matters specific to the World Wide Web.

TOTAL=45Hrs

TEXT /REFERENCE BOOKS

1. B. Raghunathan, The Complete Book of Data Anonymization: From Planning to Implementation, Auerbach Pub, 2018.
2. Alyssa Abkowitz, The Internet Tightens: (Links to an external site) Popular Chinese WeChat App to Become Official ID (Links to an external site.), Wall Street Journal, January 1, 2018
3. Bill Marczak and John Scott-Railton, Keep Calm and (Don't) Enable Macros: A New Threat Actor Targets UAE Dissidents (Links to an external site.), Citizen Lab, 2016.
4. L. Sweeney, Computational Disclosure Control: A Primer on Data Privacy Protection, MIT Computer Science, 2012
5. Ewan MacAskill, Julian Borger, Nick Hopkins, Nick Davies, and James Ball, GCHQ: Mastering the Internet, (Links to an external site.) The Guardian, July 21, 2013.

CO-PO Mapping:

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

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 Sem Professional Elective-V CSE(DS), CSE (AI& ML)
IV B Tech I Sem ME, ECE (Open Elective-IV)

L	T	P	C
3	0	0	3

20ACS28- INTERNET OF THINGS(IoT)
(Professional Elective -V)

Course Outcomes:

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

1. Understand the vision of IoT from the global context.
2. Determine the market perspective of IoT
3. Use of devices, gateways and data management in IoT
4. Designing the state of Architecture for IoT

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 **13 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 **12 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 **12 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

CO- PO MAPPING

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

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	0	3

20ACS46 COMPUTER VISION
(Professional Elective -V)

OBJECTIVES

- Review image processing techniques for computer vision.
- Understand shape and region analysis.
- Understand Hough Transform and its applications to detect lines, circles, ellipses.
- Implement three-dimensional image analysis techniques.
- 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

1. 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 algorithms for analyzing images‖, O'Reilly Media, 2012.
3. Mark Nixon and Alberto S. Aquado, ―Feature Extraction & Image Processing forComputer 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.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3							1					3	
CO2	2	2	3	2				2					2	1
CO3	2	2	2	3		2	3	1		2			1	2
CO4	2	1	3	3		3	2			3				3
C05	1			2		3	3			3				

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B. TECH I-SEMESTER CSE[DS]

L	T	P	C
3	0	0	3

20ACD30 - HEALTHCARE ANALYTICS
(Professional Elective -V)

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

- Explain the components of electronic health records, its benefits and challenges.
- Summarize the concept of Biomedical images and different methods for analysis.
- Apply data mining techniques for Natural language processing and Information retrieval.
- Analyze the Practical systems and applications for health care systems.

UNIT-I INTRODUCTION 9

Introduction- Healthcare Data Analytics- Electronic Health Records–Components of EHR- Coding Systems- Benefits of EHR- Barrier to Adopting EHR-Challenges- Phenotyping Algorithms.

UNIT-II BIOMEDICAL IMAGE ANALYSIS 9

Introduction - Biomedical Imaging Modalities- Object Detection- Image Segmentation- Image Registration- Feature Extraction- Mining of Sensor Data in Medical Informatics- Challenges in Healthcare Data Analytics – Sensor Data Mining Applications- Nonclinical Healthcare Applications- Biomedical Signal Analysis- Types- ECG Signal Analysis- Denoising signals- Multivariate Biomedical Signal Analysis- Cross-Correlation Analysis- Recent Trends.

UNIT-III GENOMIC DATA ANALYSIS 9

Introduction- Genomic Data Generation- Methods and Standards for Genomic Data Analysis- Types of Computational Genomics studies towards personalized Medicine- Genetic and Genomic studies. Natural Language Processing and Data Mining for Clinical Text- Mining the Biomedical Literature - Social Media Analytics for Healthcare.

UNIT-IV ADVANCED DATA ANALYTICS 9

Advanced Data Analytics for Healthcare– Review of Clinical Prediction Models- Temporal Data Mining for Healthcare Data- Visual Analytics for Healthcare- Predictive Models for Integrating Clinical and Genomic Data- Information Retrieval for Healthcare- Privacy- Preserving Data Publishing Methods in Healthcare.

UNIT-V APPLICATIONS 9

Applications and Practical Systems for Healthcare– Data Analytics for Pervasive Health- Fraud Detection in Healthcare- Data Analytics for Pharmaceutical Discoveries- Clinical Decision Support Systems- Computer-Assisted Medical Image Analysis Systems- Mobile Imaging and Analytics for Biomedical Data.

TOTAL=45Hrs

TEXT BOOK:

1. Chandan K. Reddy and Charu C Aggarwal, “Healthcare data analytics”, Taylor & Francis, 2015.
2. Hui Yang and Eva K. Lee, “Healthcare Analytics: From Data to Knowledge to Healthcare Improvement, Wiley, 2016.

REFERNCES:

1. Mullner, Ross M., and Edward M. Rafalski, eds. Healthcare Analytics: Foundations and Frontiers. CRC Press, 2019.
2. Madsen, Laura B. Data-driven healthcare: how analytics and BI are transforming the industry. John Wiley & Sons, 2014.
3. Giabbanelli, Philippe J., Vijay K. Mago, and Elpiniki I. Papageorgiou, eds. Advanced Data Analytics in Health. Vol. 93. Heidelberg: Springer, 2018.
4. Kumar, Vikas Vik. Healthcare Analytics Made Simple: Techniques in healthcare computing using machine learning and Python. Packt Publishing Ltd, 2018.
5. Dey, Nilanjan, et al., eds. Healthcare data analytics and management. Academic Press, 2018.

CO-PO Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B. TECH I-SEMESTER (CSE(DS))

IV B. TECH I-SEMESTER (CSE – Minor in Data Science)

L	T	P	C
3	0	0	3

20ACD31 - TEXT ANALYTICS
(Professional Elective -V)

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**	**2**
CO2	**3**	**2**	**1**									**3**	**2**
CO3	**3**	**3**	**2**									**2**	**3**
CO4	**3**	**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[DS]

L	T	P	C
3	0	0	3

20ACD32 - REAL TIME DATA STREAMING
(Professional Elective -V)

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

- Explain the basics of data stream models and methods.
- Use mining algorithms to perform clustering and classification.
- Apply Multi-dimensional analysis and Load shedding in data stream
- Analyze dimensionality reduction and forecasting on data streams

UNIT I INTRODUCTION TO DATA STREAMS 9

Introduction - Data stream models - Basic streaming methods– Applications of Data Streams- Change detection - Maintaining histograms from data streams

UNIT II STREAM MINING ALGORITHMS 9

Evaluating streaming algorithms - learning from data streams - evaluation issues – open issues. Clustering from data streams - clustering examples - clustering variables. Frequent pattern mining - frequent Itemset mining - heavy hitters - mining frequent item set from data streams - sequence pattern mining.

UNIT III CLASSIFICATION METHODS IN DATA STREAMS 9

Decision trees from data streams - very fast decision tree algorithm (VFDT) – extensions - OLIN: info-fuzzy algorithms. Novelty detection in data streams -learning and novelty - novelty detection as a one-class classification problem - learning new concepts - the online novelty and drift detection algorithms

UNIT IV ANALYSIS OF STREAM DATA 9

Multi-dimensional analysis of data - architecture for on-line analysis of data streams - stream data cube computation. Load shedding in data stream systems - load shedding for aggregation queries- load shedding in aurora - load shedding for sliding window joins - load shedding for classification queries

UNIT V ADVANCED CONCEPTS ON STREAM COMPUTING 9

Synopsis construction in data streams - sampling methods - wavelets – sketches – histograms. Join processing in data streams - indexing and querying data streams - dimensionality reduction and forecasting on streams - distributed mining of data streams

TOTAL=45Hrs

TEXT BOOKS:

1. Charu C. Aggarwal, “Data Streams: Models and Algorithms”, Kluwer Academic Publishers, Springer 2007 Edition.
2. Joao Gama, “Knowledge Discovery from Data Streams”, CRC Press, 2010.

REFERENCES:

1. Byron Ellis, “Real Time Analytics: Techniques to Analyze and Visualize Streaming Data”, John Wiley and Sons, 2014.
2. Shilpi Saxena, Saurabh Gupta, “Practical Real-time Data Processing and Analytics”, Pack publishing 2017.

CO 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	2
CO3	3	3	2	-	-	-	-	-	-	-	-	-	2	2
CO4	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, CSE(DS), CSE (AI &ML))

L	T	P	C
3	0	0	3

20AMB10 - INDUSTRIAL MARKETING
(Open Elective - III)

Course Outcomes

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. Industrial product life cycle, product mix, Service component the provision of parts, technical assistance, terms of sales.

UNIT – IV: The distribution channel component—Industrial distributors, Formulation of channel strategy-conditions influencing channel structure. Brief introduction to Marketing Logistics. The price component-conditions affecting price competition, cost factor, the nature of demand, pricing policies.

UNIT –V: The promotional component, advertising functions-establishing recognition, supporting and motivating salesmen and distributors measurement of advertising effectiveness. Personal selling-Personnel profiles selection and training, supervisions compensation sales promotion and public relations-Trade shows and exhibits, promotional novelties.

TEXT BOOKS:

1. Havaldar, K. K. (2005). Industrial Marketing: Text and Cases. India: Tata McGraw-Hill.
2. Phadtare, M. T. (2014). Industrial Marketing. India: PHI Learning.
3. Govindarajan, M. (2009). Industrial Marketing Management. India: Vikas Publishing House Pvt Limited.

REFERENCES:

1. Stacey, N., Wilson, A. (2014). Industrial Marketing Research (RLE Marketing): Management and Technique. United Kingdom: Routledge.
2. Chisnall, P. M. (1985). Strategic Industrial Marketing. United Kingdom: Prentice-Hall.
3. Brierty, E. G., Reeder, B. H., Reeder, R. R. (1991). Industrial Marketing: Analysis, Planning, and Control. United Kingdom: Prentice-Hall International.

CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	-	-	-	-	-	-	-	1	-	1	1	2
CO2	2	-	-	-	-	-	-	-	-	1	-	1	2	2
CO3	-	3	3	3	2	-	-	-	-	-	-	-	1	3
CO4	2	-	-	-	-	-	-	-	-	-	-	-	2	2
CO5	2	-	2	-	2	-	-	-	-	-	-	-	1	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 ECE – Professional Elective - V)

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

L	T	P	C
3	0	0	3

20AEC56 - EMBEDDED SYSTEMS
(Open Elective- III)

Course Outcomes:

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

CO1: Explain concept of embedded systems and its applications

CO2: Define various processors and explain their architecture

CO3: Design State machine and Concurrent Process Models

CO4: Identify embedded components, peripheral devices and apply various processor scheduling algorithms.

UNIT-I INTRODUCTION TO EMBEDDED SYSTEMS

Introduction to Embedded Systems: Definition of embedded system, history of embedded systems, classification of embedded systems, characteristics of embedded systems, major application areas of embedded systems, purpose of embedded systems , Embedded hardware units and devices in a system, Processor and OS trends in embedded systems, Core of the embedded system, memory, sensors and actuators, embedded software in a system and an overview of programming languages, examples of the embedded systems,

UNIT- II INTRODUCTION TO ASIP & DSP PROCESSORS:

Design challenge, processor technology, IC technology, Design Technology, Trade-offs. Custom Single purpose processors- RT-level combinational logic, sequential logic (RT-level), custom single purpose processor design (RT-level), optimizing custom single purpose processors. General Purpose Processors -

Basic architecture, operation- Pipelining, Programmer's view, development environment, Application Specific Instruction-Set Processors (ASIPs) – Micro Controllers and Digital Signal Processors.

UNIT III STATE MACHINE AND CONCURRENT PROCESS MODELS:

Introduction, models Vs. languages, finite state machines with data path model (FSMD), using 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.

CO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2										2	2
CO2	2		2										2	
CO3	3	2											2	2
CO4	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 (Common to CE, ME, CSE, CSE(DS), CSE(AI&ML), IT & EEE)

L	T	P	C
3	0	0	3

20AME54 OPTIMIZATION TECHNIQUES
(Open Elective - III)

Course Outcome:

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

Multi stage 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.

Text Book(s)

1. Kalyanmoy Deb, “Optimization for Engineering Design: Algorithms and Examples”, PHI Learning Private Limited, 2nd Edition, 2012.
2. Rao Singiresu S., “Engineering Optimization – Theory and Practice”, New Age International Limited, New Delhi, 3rd Edition, 2013.
3. Rajasekaran S and VijayalakshmiPai, G.A, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2011

Reference Books

1. Goldberg, David. E, “Genetic Algorithms in Search, Optimization and Machine Learning”, Pearson, 2009.

2. Srinivasan G, “Operations Research Principles and Applications”, PHI, 2017.

Mapping of COs with POs & PSOs

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO-1	3	3	3	3								3	3	2
CO-2	3	3	3	2								3	3	2
CO-3	3	3	3	3								3	3	2
CO-4	3	3	3	3								3	3	2
CO-5	3	3	2	2								1	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

L	T	P	C
3	0	0	3

20ACS47 - NoSQL DATABASES
(Job Oriented Elective - III)

Course outcome:

After completion of the course the students will be able to

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 Databasesf
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 Anywhere

The 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:

1. Sadalage, P. & Fowler, NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence, Wiley Publications,1st Edition ,2019.

Reference Books:

1. 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	2
CO3	3	3	3	3	2	-	-	-	-	-	-	-	3	2
CO4	3	3	3	2	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 CSE[DS]

L	T	P	C
3	0	0	3

20ACD33 – INTRODUCTION TO CYBER SECURITY
(Job Oriented Elective III)

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

- Explain the basic concepts of cyber security and Email attacks.
- Identify the Security features of Wi-Fi, social media and Smart phone.
- Apply the security counter measures in Online Banking Systems.
- Analyze the Cyber Security Threats and Recovery tools for IT Security.

UNIT I **8**

INTRODUCTION TO CYBER SPACE

History of Internet - Cyber Crime - Information Security - Computer Ethics and Security Policies - Guidelines to choose web browsers - Securing web browser - Antivirus - Email security

UNIT II **10**

GUIDELINES FOR SECURE PASSWORD, WI-FI SECURITY, SOCIAL MEDIA AND SMARTPHONE SECURITY

Guidelines for setting up a Secure password - Two-steps authentication - Password Manager -Wi-Fi Security - Guidelines for social media security - Tips and best practices for safer Social Networking - Basic Security for Windows - User Account Password - Introduction to mobile phones - Smartphone Security - Android Security - IOS Security

UNIT III **9**

CYBER SECURITY INITIATIVES IN INDIA

Counter Cyber Security Initiatives in India - Cyber Security Exercise - Cyber Security Incident Handling - Cyber Security Assurance - Online Banking Security - Mobile Banking Security - Security of Debit and Credit Card - UPI Security.

UNIT IV **9**

MICRO ATM, E-WALLET , POS SECURITY AND SOCIAL ENGINEERING

Security of Micro ATMs - e-wallet Security Guidelines - Security Guidelines for Point of Sales (POS) - Social Engineering - Types of Social Engineering - How Cyber Criminal Works - How to prevent for being a victim of Cyber Crime.

UNIT V **9**

CYBER SECURITY THREAT LANDSCAPE AND TECHNIQUES

Cyber Security Threat Landscape - Emerging Cyber Security Threats - Cyber Security Techniques - Firewall - IT Act - Hackers-Attacker-Countermeasures - Web Application Security - Digital Infrastructure Security - Defensive Programming - Recovering from Information Loss - Destroying Sensitive Information - CCleaner for Windows

TOTAL:45 PERIODS

TEXT BOOKS:

1. Jan L.Harrington, "Network Security – A Practical Approach", Morgan Kaufmann Publishers –An Imprint of Elsevier, 2005,
2. William Stallings, "Cryptography and Network Security – Principles and Practice", Pearson Education Asia, Fourth Edition, 2005.

REFERENCE BOOKS:

1. Charles P. Pfleeger Shari Lawrence Pfleeger Jonathan Margulies, Security in Computing, 5th Edition , Pearson Education , 2015
2. George K.Kostopoulous, Cyber Space and Cyber Security, CRC Press, 2013.
3. MarttiLehto, PekkaNeittaanmäki, Cyber Security: Analytics, Technology and Automation edited, Springer International Publishing Switzerland 2015
4. Nelson Phillips and EnfingerSteuart, "Computer Forensics and Investigations", Cengage Learning, New Delhi, 2009.

WEB REFERENCES:

1. https://onlinecourses.swayam2.ac.in/nou19_cs08/preview
2. Introduction to Cyber Security available at http://uou.ac.in/foundation-course
3. Fundamentals of Information Security https://www.uou.ac.in/progdetail?pid=MSCCS-18
4. Cyber Security Techniques https://www.uou.ac.in/progdetail?pid=MSCCS-18
5. Cyber Attacks and Counter Measures: User Perspective https://www.uou.ac.in/progdetail?pid=MSCCS-18
6. Information System https://www.uou.ac.in/progdetail?pid=MSCCS-18.
7. https://uou.ac.in/sites/default/files/slm/Introduction-cyber-security.pdf

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	-	1	-	-	-	-	-	-	2	3	2
CO2	3	2	2	-	2	-	-	-	-	-	-	1	3	2
CO3	3	2	2	-	2	-	-	-	-	-	-	1	2	2
CO4	3	2	2	-	2	-	-	-	-	-	-	1	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)
III B. Tech I Semester (Common to ME, ECE)

L	T	P	C
3	0	0	3

20AME20 - TOTAL QUALITY MANAGEMENT AND RELIABILITY ENGINEERING
(Open Elective- IV)

Course Outcome:

Upon successful 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 **11 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.

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.

CO-PO Mapping:

	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
CO1	3					3	3				1		3	0
CO2	3	3				3	3				1		3	3
CO3	3	3				3	3				1		3	3
CO4	3					3	3				1		3	3
CO5	3					3	3				1		3	3

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B. Tech I Semester (Common to ECE - Professional Elective IV)
IV B. Tech I Semester (Common CSE, IT, CSE(AI&ML), CSE(DS))

L	T	P	C
3	0	0	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 images
Image Restoration: Degradation model, Algebraic approach to restoration – Inverse filtering– Least Mean Square filters, Constrained Least square restoration

UNIT-IV IMAGE CODING:
Fidelity criteria, Image Compression Models, Huffman and Arithmetic Coding, Error
Free Compression, Lossy Compression, Lossy and Lossless Predictive Coding,
Transform Based Compression, JPEG 2000 Standards.

UNIT-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.

CO-PO Mapping:

	PO1	PO2	PO3	PO 4	PO5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	2	1										2	-
CO 2	2	1	2	2									2	1
CO 3	3	1											2	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(AI&ML), CSE(DS))

L	T	P	C
3	0	0	3

20AMB11 - SOCIAL MEDIA MARKETING
(Open Elective - IV)

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

1. Explain the required terminology and components of social media tactical and strategic plans.

2. Identify the place social media marketing has within the context of an organizations/business unit's/product's overall marketing strategy.

3. Evaluate an organizations effective engagement in social media to meet marketing objectives.

4. Measure the effectiveness of social media for marketing purposes and draft a social media strategy for a specific product.

5. Evaluate customer satisfaction level.

UNIT-I: INTRODUCTION: social media, Historical Evolution of Social Media Marketing; Understanding the concept of social media; Increasing Visibility, Engagement; Bringing Targeted traffic; Converting traffic into leads; Understanding conversion process;

UNIT-II: 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.

CO-PO Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B. TECH I-SEMESTER CSE[DS]

L	T	P	C
3	0	0	3

20ACD34 - TIME SERIES DATA ANALYSIS
(Job Oriented Elective - IV)

COURSE OUTCOMES
On completion of the course the student will be able to
1. Explain the components of Time series and modelling techniques.
2. Use the Numerical Description and approaches to Time series Modeling.
3. Apply variable selection methods and Regression models for Time series Data.
4. Analyze Exponential smoothing and ARIMA models to predict the future trends.

UNIT 1 INTRODUCTION 9 Hrs.
Introduction to Time Series -Components of a Time Series-Understanding Problem Statements and Datasets-Exploration and Pre-processing-Modelling Techniques and Evaluation

UNIT 2 STATISTICS BACKGROUND 9 Hrs.
Introduction- Graphical Displays-Numerical Description of Time Series Data (stationarity, auto covariance, autocorrelation)-Use of Data Transformations and Adjustments-General Approach to Time Series Modeling and Forecasting- Evaluation and Monitoring Forecasting Model Performance

UNIT 3 REGRESSION ANALYSIS 9 Hrs.
Introduction-Least Squares Estimation in Linear Regression-Prediction of New Observations-Model Adequacy Checking-Variable Selection Methods in Regression-Generalized and Weighted Least Squares-Regression Models for General Time Series Data

UNIT 4 EXPONENTIAL SMOOTHING METHODS 9 Hrs.
Introduction-First-Order Smoothing-Modeling Time Series Data-Second-Order Exponential Smoothing-Higher-Order Exponential Smoothing-Forecasting-Exponential Smoothing for Seasonal Data-Exponential Smoothers and ARIMA Mode.

UNIT 5 AUTOREGRESSIVE INTEGRATED MOVING AVERAGE (ARIMA) MODELS
9 Hrs.
Introduction-Linear Models for Stationary Time Series-Finite Order Moving Average Processes-Finite Order Autoregressive Processes-Mixed Autoregressive – Moving Average (ARMA)-Nonstationary Processes-Time Series Model Building-Forecasting ARIMA Processes-Seasonal Processes.

TOTAL=45Hrs

TEXT BOOKS

1. Time Series Analysis Univariate and Multivariate Methods, 2nd Edition. W. Wei, 2006, Addison Wesley.
2. Time Series Analysis, J. Hamilton, 1994, Princeton University Press.

REFERENCE BOOKS:

1. Time Series Analysis: Theory and Methods, P. Brockwell and R. Davis, 1991, Springer-Verlag.
2. Time Series Analysis and Its Applications with R Examples, Shumway, R. and Stoer, D., 2006,

Springer.
3. Introductory Time Series with R (Use R!) 2009th Edition
4. Time Series Analysis and Its Applications: With R Examples (Springer Texts in Statistics) 3rd ed. 2011 Edition
5. Practical Time Series Forecasting with R: A Hands-On Guide [2nd Edition], (Practical Analytics) 2nd Edition by Galit Shmueli, Kenneth C. Lichtendahl Jr.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**1**									**3**	
CO2	**3**	**2**	**1**									**3**	**2**
CO3	**3**	**3**	**2**									**2**	**3**
CO4	**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 CSE[DS]

L	T	P	C
3	0	0	3

20ACD35 - BAYESIAN DATA ANALYSIS
(Job Oriented Elective - IV)

COURSE OUTCOMES

On completion of the course the student will be able to

- Explain the basics of probability and relate it to the Bayesian inference.
- Use inference rules for customized single parameter models.
- Apply inference mechanism for multi-parameter and hierarchical models.
- Analyze how implement inference mechanism for different non-linear models.

UNIT-I INTRODUCTION **9**

Introduction to Probability, Priors and Posterior Analysis, Statistical Models, The Bayes inference, Bayes Rule, Normal model, Conjugate model, Binomial model, Posterior Distribution and Inferences.

UNIT-II SIMULATION **9**

Markov Chain Monte Carlo simulation, Introduction to R and Jags, The Metropolis-Hasting algorithm, Gibbs Sampler, Approximation based on posterior modes.

UNIT-III MULTI-PARAMETER AND HIERARCHICAL MODELS **9**

Multi-parameter -Normal data with non-informative, conjugate, and semi-conjugate prior distributions, Multivariate normal model, Hierarchical - Exchangeability and setting up, Computation.

UNIT-IV FUNDAMENTALS OF BAYESIAN DATA ANALYSIS **9**

Model checking, Evaluating, comparing, and expanding models, Modeling accounting for data collection, Decision analysis

UNIT-V NON-LINEAR MODELS **9**

Mixture models- Setting up and interpreting mixture models, Gaussian process models Multivariate models- Non-normal models and multivariate regression surfaces

Comparison of Population

Inference for Proportions, Inference for Normal Populations, Inference for Rates, Sample Size Determination

TOTAL=45Hrs

TEXT BOOKS

1. Ronald Christensen, Wesley Johnson, Adam Branscum, Timothy E Hanson, Bayesian Ideas and Data Analysis. An Introduction for Scientists and Statisticians. CRC Press, 2011
2. Andrew Gelman, John B, Carlin,Chapman ,Bayesian Data Analysis, Hall/CRC Publication, 2013.

REFERENCES

1. Gelman, A., Carlin, J. B., Stern, H. S., Rubin, D. B.Bayesian Data Analysis, Third Edition, Chapman & Hall/CRC.2013
2. Gill, Jeff. Bayesian Methods: A Social and Behavioral Science Approach. CRC. 3rd Edition.2013.
3. Peter D. Hoff, A First Course in Bayesian Statistical Methods, Springer, 2009.

CO-PO Mapping:

CO/PO	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	2
CO4	3	2	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 (Common to CSE(AI&ML), CSE(DS))

II B. TECH I SEMESTER CSE

L	T	P	C
1	0	2	2

20ACS11 - ANDROID APPLICATION DEVELOPMENT
(Skill Course)

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 ofDevices.
3. Demonstrate methods in preferences and settings and storing data in Android applications.
4. Demonstrate methods in sharing and loading data in Android Applications.

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 alongwith 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

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.

Task7- Create a user registration application that stores the user details in a database table.

Task 8- 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

CO-PO MAPPING

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Common to CE, EEE, ME, ECE, CSE, IT, CSE(AI&ML) & CSE(DS))

L	T	P	C
2	0	0	0

20AMB12 - PROFESSIONAL ETHICS
(Mandatory Course)

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

1. Identify and analyze an ethical issue in the relevant field.
2. Apply specific ethical theories to current social issues.
3. Identify significant problems in contemporary professional ethics.
4. Explain the ethical roles of engineers in industry and society.
5. Explain moral and ethical obligations toward the environment.

UNIT I INTRODUCTION: Professionalism-models of professionalism-Ethics-Types of ethics and morality-Engineering ethics-Positive and negative faces of ethics-Responsibility for safety-Technology pessimism and perils of technological optimism.

UNIT II ETHICAL CONCEPTS: Human Values – morals-integrity-work ethics-Respect for others-respect for authority-conflicts of interests-moral dilemmas-honesty- courage-cooperation-valuing time-commitment-collegiality-loyalty-self -interest-Professional accountability-royalty-Problem of bribery, extortion and grease payments-problem of nepotism, excessive gifts-confidentiality-uses of ethical theories-Kohlberg's Theory- Gilligan`s Theory-Ethical codes of IEEE and Institution of Engineers.

UNIT III ENGINEERS ROLE IN SAFETY: Safety and risks-risk and costs-risk benefit analysis-Testing methods for safety-The promise of technology-Computer Technology Privacy-Social Policy-Engineering standards-the standards care-Social and value dimensions of technology-communicating risk and public policy-occupational crime-professional rights and employee rights-whistle blowing.

UNIT IV ROLES OF ENGINEERS: Engineers as managers, Advisors, Consultants, Experts and witnesses- Engineers role in industry and society- models of professional roles-Theories about right action-paternalism-different business practices-Moral leadership- Cases - Bhopal gas tragedy, Nuclear power plant disasters.

UNIT V ENVIRONMENTAL ETHICS: Global Issues-Multinational corporations-Living in harmony with NATURE-Holistic technology-Eco friendly production system-sustainable technology and development-weapon development-Four orders of living, their interconnectedness-Eco system-Ozone depletion-pollution

Text Books:

1. Subramanian R, Professional Ethics,1st Edition, Oxford University Press. 2013.
2. Naagarazan , R.S., A Textbook on Professional Ethics and Human Values,1st edition, New Age International (P) Limited, Publishers New Delhi.,2014
3. R. R. Gaur, R. Sangal and G. P. Bagaria, Human Values and Professional Ethics:,EecelBooks,New Delhi.2010.

Reference Books:

1. Fundamentals of Ethics for scientists and Engineers, Edmond G Seebauer and Robert L. Barry, 1st edition Oxford University Press, 2008.
2. Professional Ethics and Human Values – M.Govindrajan, S.Natarajan and V.S. Senthil Kumar, PHI Learning Pvt. Ltd. Delhi.
3. Professional Ethics and Human Values: Prof. D.R. Kiran, TATA McGraw Hill Education, 2007.
4. Charles D Fleddermann, "Engineering Ethics", Prentice Hall.
5. Charles E Harris, Micheal J Rabins, "Engineering Ethics, Cengage Learning.

CO-PO MAPPING

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

HONORS DEGREE: Students has to acquire 20 credits with minimum one subject from each pool @ 4 credits per subject.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
II B. TECH II SEMESTER-CSE (DS)

	L	P	T	C
Code:20ACD38	**3**	**0**	**1**	**4**

CRYPTOLOGY

[HONORS DEGREE – POOL I]

Course Outcomes:

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

1Summarize the basic concepts of the cryptosystems and analyze the various encryption and techniques for problem solving.

2.Aquire knowledge about the concept of block cipher, encryption standards and various data compression techniques.

3. Analyze key management techniques, ability to design discrete logarithm-based system and evaluate its performance

4. Learn about elliptic curve-based system to provide security as well as in problem solving.

UNIT I **8 hrs**

Introduction-Introduction and Terminology-Shannon's Description of a Conventional Cryptosystem-Statistical Description of a Plaintext Source. **Classical Cryptosystems**-Caesar Cipher-Simple Substitution-Vigenère Cryptosystem-The Incidence of Coincidences, Kasiski's Method-The One-Time Pad-The Playfair Cipher-Transposition Ciphers-Problems.

UNITII **9 hrs**

Block Cipher And Data Encryption Standards: Block Cipher Principles, Data Encryption Standards, the Strength of DES, Differential and Linear Crypt Analysis, Block Cipher Design Principles. Advanced Encryption Standards: Evaluation Criteria For AES, The AES Cipher. More On Symmetric Ciphers: Multiple Encryption, Triple DES, Block Cipher Modes Of Operation, Stream Cipher And RC4

UNIT III **9 hrs**

Shannon Theory and Data Compression Techniques

Entropy, Redundancy, and Unicity Distance-Mutual Information and Unconditionally Secure Systems-Problems.

Data Compression Techniques- Basic Concepts of Source Coding for Stationary Sources- Huffman Codes-Universal Data Compression - The Lempel-Ziv Algorithms-problems.

UNIT IV **9 hrs**

Discrete Logarithm Based System- The Discrete Logarithm System- The Discrete Logarithm Problem- The Diffie-Hellman Key Exchange System- Other Discrete Logarithm Based Systems- ElGamal's Public-Key Cryptosystems-The Pohlig-Hellman Algorithm- The Baby-Step Giant-Step Method-problems

UNIT-V **10 hrs**

Elliptic Curves Based Systems- Some Basic Facts of Elliptic Curves- A Line Through Two Distinct Points- A Tangent Line- Cryptosystems Defined over Elliptic Curves- The Discrete Logarithm Problem over Elliptic Curves-The Discrete Logarithm System over Elliptic Curves- The Security of Discrete Logarithm Based EC Systems-problems

TextBooks:

William Stallings, “Cryptography and Network Security: Principles and Practices”, 4th Edition, Low Price Edition, Pearson Education, 2008.
Henk C.A. van Tilborg ,”FUNDAMENTALS OF CRYPTOLOGY: A Professional Reference and Interactive Tutorial” KLUWER ACADEMIC PUBLISHERS,2002.

ReferenceBooks:

William Stallings, “Network Security Essentials (Applications and Standards)”, 3rd Edition, Pearson Education, 2008.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	-	-	-	-	-	-	-	-	3	
CO2	3	2	-	-	2	-	-	-	-	-	-	-		3
CO3	3	3	2	-	3	-	-	-	-	-	-	-		2
CO4	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 II SEMESTER-CSE (DS)

	L	P	T	C
Code:20ACD39	**3**	**-**	**1**	**4**

MOBILE COMPUTING
[HONORS DEGREE – POOL I]

Course Outcomes:

1. Grasp the concepts and features of mobile computing technologies, telecommunication system and applications.
2. Have a good understanding of how the underlying wireless and mobile communication networks work, their technical features, and what kinds of applications they can support.
3. Identify the important issues of developing mobile IP and solution for each functionality at each layer.
4.Competent to implement protocols with the characterization and architecture of mobile applications

UNIT I **9 hrs**

Medium Access Control : Motivation for Specialized MAC- SDMA- FDMA- TDMA- CDMA- Comparison of Access mechanisms – Tele communications : GSM- DECT- TETRA – UMTS- IMT-200 – Satellite Systems: Basics- Routing- Localization- Handover- Broadcast Systems: Overview – Cyclic Repetition of Data- Digital Audio Broadcasting – Digital Video Broadcasting

UNIT II **9 hrs**

Wireless LAN: Infrared Vs Radio Transmission – Infrastructure Networks- Ad hoc Networks- IEEE 802.11 – HIPERLAN – Bluetooth- Wireless ATM: Working Group- Services- Reference Model – Functions – Radio Access Layer – Handover- Location Management- Addressing Mobile Quality of Service- Access Point Control Protocol

UNIT III **9 hrs**

Mobile IP : Goals – Assumptions and Requirement – Entities – IP packet Delivery- Agent Advertisement and Discovery – Registration – Tunneling and Encapsulation – Optimization – Reverse Tunneling – IPv6 – DHCP- Ad hoc Networks

UNIT IV **9 hrs**

Traditional TCP- Indirect TCP- Snooping TCP- Mobile TCP- Fast retransmit/ Fast Recovery- Transmission/ Timeout Freezing – Selective Retransmission- Transaction Oriented TCP

UNIT V **9 hrs**

Protocols for mobile computing: mobile network layer-mobile IP- Snooping- TCPMobile TCP- Fast and selective retransmission and recovery- Transaction oriented TCP.

Wireless Application Protocol-WAP architecture- wireless datagram protocol-transport layer security- WML- script.

TEXTBOOK

1. J.Schiller, Mobile Communication, Addison Wesley, 2000.
2. William Stallings, Wireless Communication and Networks, Pearson Education, 2003.

REFERENCES:

1. Reza B, "Far, "Mobile Computing Principles:, Designing And Developing Mobile
2.Application With Uml And Xml", Cambridge University Press,2005.
3. William C.Y.Lee, "Mobile Communication Design Fundamentals", John
Wiley,1993

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	-	-	-	-	-	-	-	-	3	
CO2	3	3	-	-	-	-	-	-	-	-	-	-		3
CO3	3	3	2	-	-	-	-	-	-	-	-	-		2
CO4	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 (DS) and IT)

	L	P	T	C
Code:20ACD40	**3**	**-**	**1**	**4**

REVERSE ENGINEERING

[HONORS DEGREE – POOL I]

Course Outcomes:

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

1. Understand the problem in the existing process.
2. Collect the large number of data/ information for the product.
3. Depth analyze of the products and extraction of real time data.
4. Understand the principles behind the design of the product, ways to redesign and improve the performance of the system.

UNIT-I:-Foundations **9 hrs**

Introduction to Reverse Engineering. Software Reverse Engineering: Reversing, Reversing Applications, Security-Related Reversing, Reversing Cryptographic Algorithms, Digital Rights Management, Reversing in Software Development, Evaluating Software Quality and Robustness,

Low-Level Software. Levels of abstraction: Application level, Functional level, Structural level.

UNIT II **9 hrs**

Reverse Engineering Methodology.

Detailed study of Reverse Engineering for Branch Specific learning Dissemble the existing selected artefact/ product/ component/ process/ system to study technical aspects and design detail, Reverse engineering in various computer software/ application, CASE STUDY EIS Client Application, Implementation level..

UNIT III **9hrs**

Software **Reverse Engineering**

Reverse engineering of software, Binary reverse engineering, Binary software techniques, Software classification, Source code, number of UML tools, Reverse engineering of Protocols.

UNIT IV **9hrs**

Reversing **Tools**

Different Reversing Approaches, Debuggers, User-Mode Debuggers, Kernel-Mode Debuggers, System-Monitoring

Tools, Patching Tools, Hex Workshop, Miscellaneous Reversing Tools, Executable-Dumping Tools.

UNIT V 9hrs

Applied Reversing.

Reversing and Interoperability, Deciphering File Formats, Cryptex, Using Cryptex, Reversing Cryptex, The Password Verification Process, The Password Transformation Algorithm, Hashing the Password.

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

	L	P	T	C
Code:20ACD41	3	-	1	4

MINING MASSIVE DATASET
[HONORS DEGREE – POOL I]

Course Outcomes:

- Understand the basic concepts of Mining and Massive Dataset.
- Study the Concepts of Learning about the functions, methods, hashing of systems and Technologies.
- Learn about the Sampling Data, Clustering Techniques and Problems.
- Analyse functions of Various Algorithms used in Data Mining and Data Set.

UNIT I 9 hrs

Data Mining: What is Data Mining, Statistical Limits on Data Mining, Things Useful to Know, Outline of the Book, Large-Scale File Systems and Map-Reduce, Distributed File Systems, Map-Reduce, Algorithms Using Map-Reduce, Extensions to Map-Reduce, Efficiency of Cluster-Computing Algorithms.

UNIT II 9 hrs

Finding Similar Items: Applications of Near-Neighbor Search, Shingling of Documents, Similarity-Preserving Summaries of Sets, Locality-Sensitive Hashing for Documents, Distance Measures, The Theory of Locality-Sensitive Functions, LSH Families for Other Distance Measures, Applications of Locality-Sensitive Hashing, Methods for High Degrees of Similarity.

UNIT III 9 hrs

Mining Data Streams: The Stream Data Model, Sampling Data in a Stream, Filtering Streams, Counting Distinct Elements in a Stream, Estimating Moments, Counting Ones in a Window, Decaying Windows, Link Analysis , PageRank , Efficient Computation of PageRank, Topic-Sensitive PageRank, Link Spam, Hubs and Authorities.

UNIT IV 9 hrs

Frequent Itemsets : The Market-Basket Model , Market Baskets and the A-Priori Algorithm, Handling Larger Datasets in Main Memory . Limited-Pass Algorithms, Counting Frequent Items in a Stream, Clustering, Introduction to Clustering Techniques, Hierarchical Clustering, K-means Algorithms, The CURE Algorithm, Clustering in Non-Euclidean Spaces, Clustering for Streams and Parallelism.

UNIT V 9 hrs

Advertising on the Web : Issues in On-Line Advertising , On-Line Algorithms, The Matching Problem, The Adwords Problem, Adwords Implementation, Recommendation Systems, A Model for Recommendation Systems , Content-Based Recommendations, Collaborative Filtering, Dimensionality Reduction, The NetFlix Challenge .

TEXT BOOKS :

Anand Rajaraman and Jeff Ullman, Mining of Massive Datasets, Cambridge. Press.

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	3	-	-	-	-	-	-	3	**3**	**3**
CO2	3	-	-	-	3	-	-	-	-	-	-	3	**3**	**3**
CO3	3	3	-	-	3	-	-	-	-	-	-	3	**2**	**3**
CO4	3	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[DS]
III B. TECH II-SEMESTER- IT [HONORS DEGREE – POOL III]

L	T	P	C
3	1	0	4

20ACD42 REINFORCEMENT LEARNING
[HONORS DEGREE – POOL II]

COURSE OUTCOMES
At the end of this course, the learner can able to

- Solve real-world Processes problems using Markov Decision
- Use iterative policy evaluation, policy improvement, policy iteration, and value iteration.
- Apply classic Monte Carlo prediction and control methods.
- Differentiate the Sarsa, Q-Learning, and Expected Sarsa algorithms.
- Analyze the concepts of Function Approximation, Learning & Planning.

UNIT-I REINFORCEMENT PROBLEM 9
Introduction - Elements of RL, Limitations and Scope - Evaluative feedback -Goals and rewards – Returns – Markovian Decision Problem – Value functions - Optimality and Approximation. Pole Balancing, Grid world-use a rectangular grid to illustrate value functions for a simple finite MDP

UNIT-II DYNAMIC PROGRAMMING 9
Policy Evaluation- Policy Improvement- Policy Iteration - Value Iteration - Asynchronous Dynamic Programming- Generalized Policy Iteration - Efficiency of Dynamic Programming. Solving car rental problem using Policy Iteration, Solving a Gambler's Problem using the value iteration algorithm.

UNIT-III MONTE CARLO METHODS 9
Monte Carlo Prediction - Monte Carlo Control- Monte Carlo Control without Exploring Starts- On- policy Monte Carlo controls – Off policy Monte Carlo controls -Incremental implementation. Implementation of MC prediction for estimating the state-value function and Calculate and plot the state-value function estimate, Implementation of MC prediction for estimating the action-value function.

UNIT-IV TEMPORAL DIFFERENCE LEARNING 9
TD prediction- Optimality of TD – Sarsa - Q-Learning – Actor Critic Methods -R- Learning - Games, Afterstates, and Other Special Cases.Implementation of TD prediction for estimating the state-value function,Implementation of Sarsa Control algorithm, Implementation of Q-learning Control algorithm.

UNIT-V FUNCTION APPROXIMATION, PLANNING AND LEARNING 9
Value prediction and control – Gradient Descent methods -Linear methods – Model and planning- Prioritized sweeping - Heuristic search - Case Studies. Rod Maneuvering with Prioritized Sweeping, Mountain Car Task.

TOTAL: 45 PERIODS

REFERENCES

1 CsabaSzepesvári, "Algorithms for Reinforcement Learning", Morgan & Claypool, 2013.

2 Kevin Murphy, "Machine Learning - A Probabilistic Perspective", MIT press, 2012. 4. Christopher Bishop, "Pattern Recognition and Machine Learning", Springer, 2006.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	2	2	-	-	-	-	-	-	-	-	-	3	3
C02	3	3	2	-	-	-	-	-	-	-	-	-	3	2
C03	3	2	2	-	-	-	-	-	-	-	-	-	3	2
C04	3	2	2	-	-	-	-	-	-	-	-	-	3	2
CO5	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 I-SEMESTER CSE[DS]

L	T	P	C
3	1	0	4

20ACD43 - WEB SERVER PROGRAMMING
[HONORS DEGREE – POOL II]

COURSE OUTCOMES

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

- Explain the terminologies related to server-side programming.
- Use the concept learned in server-side programming. Apply To analyze the server-side requirements.
- Estimate suitable architecture for server-side modules.
- Analyze the testing and deployment of server programs

UNIT I INTRODUCTION TO NODE.JS **9**

Overview of Node.js - event-driven architecture - advances in the JavaScript language - TypeScript and Node.js - Developing microservices with Node.js -Installing Node.js using package managers - Exploring Node.js Modules: Defining a Node.js module - Understanding the Node.js core modules - Finding and loading modules using require and import - Using npm – the Node.js package management system -The Yarn package management system

UNIT II HTTP SERVERS AND CLIENTS **9**

Sending and receiving events with Event Emitter - Understanding HTTP server applications - HTTP Sniffer – listening to the HTTP conversation -Web application frameworks -Getting started with Express - Creating an Express application to compute Fibonacci numbers - Making HTTPClient requests - Calling a REST backend service from an Express application - Developing the Express Application: Async functions in Express router functions -Architecting an Express application in the MVC paradigm.

UNIT III MOBILE FIRST DESIGN AND DATA STORAGE **9**

Implementing the Mobile-First Paradigm - Bootstrap - Flexbox and CSS Grids - Mobile-first design -Laying the Bootstrap grid foundation - Responsive page header navigation bar - Data Storage and Retrieval: Storing notes in a file system - Storing notes with the LevelDB datastore - Storing notes in SQL with SQLite3 - Storing notes the ORM way with Sequelize - Storing notes in MongoDB

UNIT IV AUTHENTICATION AND SOCKET IO **9**

Authenticating Users with a Microservice: Creating a user information microservice - Creating a user in the user information database - Providing login support - Accessing the user authentication REST API - Incorporating login and logout routing functions Keeping secrets and passwords secure - Dynamic Client/Server Interaction with Socket.IO: Introducing Socket.IO.

UNIT V TESTING AND DEPLOYMENT **9**

Testing Node applications: Unit testing - Functional testing - Dealing with failing tests - stack traces. Deploying Node applications and maintaining uptime: Hosting Node applications - Platform as a service - Servers - Containers - Understanding deployment basics - Deploying from a Git repository - Maximizing uptime and performance -Hosting static files and proxying

TOTAL: 45 PERIODS

TEXTBOOKS

1. Cantelon, M., Harter, M., Holowaychuk, T.J., Rajlich, N., 2013. Node.js in Action, 1st edition. ed. Manning Publications, Shelter Island.
2. Herron, D., 2016. Node.js Web Development: Create real-time server-side applications with this practical, step-by-step guide, 3rd Edition, 3rd edition. ed. Packt Publishing.

REFERENCE BOOKS

1. Syed, B., 2014. Beginning Node.js, 1st ed. edition. ed. Apress, New York, NY.
2. Casciaro,M., 2016. Node.js Design Patterns -: Master best practices to build modular and scalable server-side web applications, 2nd edition. ed. Packt Publishing Limited, Birmingham.
3. Teixeira, P., 2012. Professional Node.js: Building Javascript Based Scalable Software, 1st edition. ed. Wrox.

CO-PO Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
[AUTONOMOUS]
III B. TECH I-SEMESTER CSE[DS]

L	T	P	C
3	1	0	4

20ACD44 - WEARABLE COMPUTING
[HONORS DEGREE – POOL II]

COURSE OUTCOMES:
On completion of the course, student will be able to

- Explain different methodologies on wearable technology.
- Identify Wearable computing technology and its applications.
- Apply innovative thinking and innovation processes
- Analyze several domains through wearable technology.

UNIT 1 INTRODUCTION TO WEARABLE **9Hrs.**
Fundamentals of Wearable Technologies - History of wearable Technologies -User Experience Design for Internet of Things - Social Aspects of Wearability - Internet of Things – Applications - Wearable Chemical and Biochemical Sensors - Technology of Connected Devices – Device Types, Sensors, Actuators.

UNIT 2 WEARABLE COMPUTING APPLICATIONS **9Hrs.**
Medical Applications of Wearable Technologies - Wearable Technologies - Energy Expenditure and Energy Harvesting - Technology of Connected Devices – Energy Considerations - Flexible Electronics and Textiles for Wearable Technologies.

UNIT 3 WEARABLE COMPUTING ARCHITECHTURE **9Hrs.**
Wearable Algorithms - Web of Things – Architecture Standardization- Data Mining for Body Sensor Network - Internet of Things – Embedded Device UX Design

UNIT 4 COMMUNICATION TECHNOLOGIES **9Hrs.**
Physical Activity Modeling and Behavior Change - Internet of Things – Interface and Interaction Design - Human Body Communication for a Data Rate Sensor Network. Internet of Things – Networking. - Wireless Body Area Networks - Wearable Computing as a form of urban design

UNIT 5 WEARABLE COMPUTING CASE STUDIES **9Hrs.**
Wearable Sensors for Monitoring of Physical and Physiological Changes and for Early Detection of Diseases - Wearable and Non-Invasive Assistive Technologies.

TOTAL=45 Hrs.

TEXT BOOKS/ REFERENCE BOOKS:
1.“Practical Electronics for Inventors, Third Edition,” by Paul ScherzandSimon Monk. 2016
2.Intel Galileo and Intel Galileo Gen 2API Features and Arduino Projects for Linux Programmers, Ramon, Manoel 2014 (Open Access)
3.Fundamentals of Wearable Computers and Augmented Reality, Second Edition by Woodrow Barfield 2015
4.Making Sense of Sensors: End-to-End Algorithms and Infrastructure Design By OmeshTickoo, Ravi Iyer 2016
5.Programming Interactivity, Second Edition By Josha Noble, 2012
6.Programming the Raspberry Pi: Getting Started with Python 2E, 2016

CO-PO Mapping:

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

L	T	P	C
3	1	0	4

20ACD45 - SERVICE ORIENTED ARCHITECTURE
[HONORS DEGREE – POOL II]

COURSE OUTCOMES:

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

- Explain fundamentals of Service oriented architecture
- Describe the concept of Service oriented Analysis and design
- Apply SOA technologies and Web Framework.
- Analyze the Transaction processing of SOA.

UNIT 1 SOA INTRODUCTION 9 Hrs.

Software Architecture – Web Services - Service-Oriented Architectures - Cloud Computing - Types of IT Architecture – SOA – Evolution – Key components – perspective of SOA – Enterprise-wide SOA – Architecture – Enterprise Applications – Solution Architecture for enterprise application – Software platforms for enterprise Applications – Patterns for SOA – SOA programming models.

UNIT 2 ANALYSIS AND DESIGN 9 Hrs.

Service-oriented Analysis and Design – Design of Activity, Data, Client and business process services – Technologies of SOA – SOAP – WSDL – JAX – WS – XML WS for .NET – Service integration with ESB – Scenario– Business case for SOA – stakeholder objectives - benefits of SPA – Cost Savings.

UNIT 3 SOA TECHNOLOGIES 9 Hrs.

SOA implementation and Governance – Strategy – SOA development – SOA governance –Trends in SOA – Event-driven architecture – Software as a service – SOA technologies – Proof-of-concept – Process orchestration – SOA best practices - Oracle SOA - cloud integration - SOA governance - API management.

UNIT 4 WEB SERVICE FRAMEWORK 9 Hrs.

Meta data management – XML security – XML signature – XML Encryption – SAML – XACML – XKMS – WS- Security –Security in web service framework - Advanced messaging.

UNIT 5 TRANSACTION PROCESSING 9 Hrs.

Transaction processing – Paradigm – Protocols and co-ordination – Transaction specifications – SOA in mobile – Research issues – Oracle SOA event processing.

TOTAL=45Hrs.

TEXT / REFERENCE BOOKS

1.Shankar Kambhampaly, “Service –Oriented Architecture for Enterprise Applications”, Wiley India Pvt Ltd, 2008.
2.Eric Newcomer, Greg Lomow, “Understanding SOA with Web Services”, Pearson Education.
3.Mark O’ Neill, et al. , “Web Services Security”, Tata McGraw Hill.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	3	2	2									2	2
CO2	3	3	1	11								3	2
CO3	3	3	2	2								3	2
CO4	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 CSE[DS]

L	T	P	C
3	1	0	4

20ACD46 - HEALTH INFORMATICS
[HONORS DEGREE – POOL III]

COURSE OUTCOMES:
On completion of the course, student will be able to

- Explain the problems and challenges of health informatics
- Use basic skills and knowledge in health informatics.
- Apply search for information on health-related questions.
- Analyze visualization and simple analysis of a dataset.

UNIT 1 INTRODUCTION & OVERVIEW 9 Hrs.
Define information management, information technology and informatics - Various ways in which HIT has evolvd to improve quality or enhance patient safety - Informatics drivers and trends - Standards development organizations: Health Level 7 (HL-7), Healthcare Information Technology Standards Panel (HITSP), and Office of the National Coordinator for Health Information Technology (ONC) Health IT Standards Committee-Health informatics – Needs, objectives and limitations - Medical Terminology for Health Informatics Professionals

UNIT 2 CLINICAL DECISION SUPPORT SYSTEMS (CDSS) 9 Hrs.
Fundamental requirements of an effective Clinical Decision Support System-principles of health care data exchange and health care data standards relate to patient care, productivity and data analysis- common controlled vocabularies in use today: ICD, CPT, NDC, RxNorm, LOINC and SNOMED CT-advantages and disadvantages (unintended consequences) of Clinical Decision Support Systems (CDSS) in terms of cognitive support

UNIT 3 HEALTHCARE DATABASE MANAGEMENT SYSTEM 9 Hrs.
Health information systems – design, architecture and interoperability - Electronic health records (EHRs) - Electronic medical record (EMR) with electronic health record (EHR)- emergence of Personal Health Records and their implications for patients, health care providers and Decision Aids and health systems-EHR access agreement

UNIT 4 COMPUTER APPLICATIONS IN HEALTH CARE 9 Hrs.
The language of biomedical informatics: data, information & knowledge; standards and vocabularies - Evidence based practice (EVP) and clinical practice guidelines (CPG) - Evaluation methods for health informatics - Machine learning for extraction of medical knowledge - MATLAB programming for health informatics

UNIT 5 CASE STUDIES AND ETHICAL ISSUES 9 Hrs.
Modeling, simulation and visualisation in health informatics - Ethical Issues in Health Informatics - Fundamentals of data science in medicine - Genomic and Systems Medicine -Advanced data analysis in medicine - Data driven decision making and evaluation in medicine - Legal Aspects of Health Information Systems - E-Healthcare & Ethics - E-Medicine Business Models - Case Studies in Health Information Management.

TOTAL=45Hrs

TEXT/REFERENCE BOOKS:
1.Hoyt, RE and Yoshihashi, A, Eds. (2014). Health Informatics: Practical Guide for Healthcare and

Information Technology Professionals, SixthEdition. Pensacola, FL,Lulu.com.
2.Wager KA, Lee FW, Glaser JP. Health Care Information Systems: A Practical Approach for Health Care Management. San Francisco, California: Jossey-Bass 2009.
3.Shortliffe EH, Cimino JJ. Biomedical Informatics: Computer Applications in Health Care and Biomedicine, Fourth Edition. New York, New York: Springer Science +Business Media, LLC 2014.
4.Uri Alon. An Introduction to Systems Biology: Design Principles of Biological Circuits (Chapman & Hall/CRC Mathematical and Computational Biology) Jul 2006.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**	**2**	**1**								**2**	**2**
CO2	**3**	**3**	**1**									**3**	**2**
CO3	**3**	**3**	**2**	**1**								**3**	**2**
CO4	**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 CSE[DS]

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3	1	0	4

20ACD47 - FUNDAMENTALS OF AUTONOMOUS SYSTEM
[HONORS DEGREE – POOL III]

COURSE OUTCOMES

On completion of the course, student will be able to

- Select & identify suitable agents for autonomous system.
- Describe & explain potential behaviour of various autonomous agent.
- Differentiate various control aspects of autonomous agents and environments
- Analyze various communication techniques in JASON

UNIT 1 INTRODUCTION TO AUTONOMOUS SYSTEM 9 Hrs.

Autonomous Agent and environment- intelligent agents-agent architecture-systems-deliberative agents-reactive agents-agent with state-robot-robot with state-introduction to mobile robotics- control architecture-mapping-localization-navigation-classical- deliberative approach.

UNIT 2 AUTONOMOUS AGENT BEHAVIOUR ANALYSIS 9 Hrs.

Practical Reasoning-planning- planner example-blocks world-plans and action-formal representation-implementation of practical reasoning agent-deliberation-Degrees of commitment-intention reconsideration.

UNIT 3 AUTONOMOUS AGENT PROGRAMMING 9 Hrs.

Various Programming language for agents-introduction to agent speak-procedural reasoning system-BDI logics-prolog- architecture of agent speak-rules implementation-events execution-plans-environments-programming multi-agent system.

UNIT 4 PROGRAMMING IN JASON FOR AUTONOMOUS SYSTEM 9 Hrs.

Introduction to Jason-simple programs-mars rover example-environment-garbage collection example-functionality of Jason interpreter-loops-perception-belief update-other agent messages-acceptable messages-event handling-relevant plans- implementing plans-intention-failure handling.

UNIT 5 COMMUNICATION PROGRAM 9 Hrs.

Communication in Jason-messages-semantics-protocol-stages-CNP in Jason-refusing agent-no responsive agent-active agent-initiator agent program.

TOTAL=45Hrs.

TEXT / REFERENCE BOOKS

1. An introduction to multi agent system-second edition-Michael Wooldridge-John Wiley & Sons publication, 2009.
2. Introduction to Autonomous mobile robots-second edition -Roland Siegwart, Illah Reza Nourbakhsh and Davide Scaramuzza –MIT Press Publications,2011.
3. Programming multi-agent systems in agentspeak using Jason-Rafael H.Bordnin, Jomi Fred Hubner and Michael Wooldridge-wiley publications.
4. Beginning Robotics Programming in Java with Lego Mindstorms, Wei Lu (Apress/Springer publications).

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	3	2	1									2	3
CO2	3	2	3									2	3
CO3	3	2	2									3	2
CO4	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 CSE[DS]

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20ACD48 - AGENT BASED INTELLIGENT SYSTEMS
[HONORS DEGREE – POOL III]

COURSE OUTCOMES:

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

- Explain the basics of Agent based systems and game playing techniques.
- Describe various planning problems
- Apply the various approaches to handle uncertainty
- Analyze knowledge in higher level agents

UNIT 1 INTRODUCTION 9 Hrs.

Definitions - Foundations - History - Intelligent Agents - Problem Solving - Searching - Heuristics - Constraint Satisfaction Problems - Game playing.

UNIT 2 KNOWLEDGE REPRESENTATION AND REASONING 9 Hrs.

Logical Agents - First order logic - First Order Inference – Unification – Chaining - Resolution Strategies - Knowledge Representation – Objects – Actions – Events.

UNIT 3 PLANNING AGENTS 9 Hrs.

Planning Problem - State Space Search - Partial Order Planning – Graphs - Nondeterministic Domains - Conditional Planning - Continuous Planning - Multivalent Planning.

UNIT 4 AGENTS AND UNCERTAINITY 9 Hrs.

Acting under uncertainty – Probability Notation - Bayes Rule and use - Bayesian Networks - Other Approaches - Time and Uncertainty - Temporal Models - Utility Theory - Decision Network – Complex Decisions.

UNIT 5 HIGHER LEVEL AGENTS 9 Hrs.

Knowledge in Learning - Relevance Information - Statistical Learning Methods - Reinforcement Learning - Communication - Formal Grammar - Augmented Grammars - Future of AI.

TOTAL=45 Hrs.

TEXT / REFERENCE BOOKS

1.Stuart Russell and Peter Norvig, “Artificial Intelligence - A Modern Approach”, 3rd edition, Prentice Hall, 2010.
2.Michael Wooldridge, “An Introduction to Multi Agent System”, John Wiley, 2002.
3.Patrick Henry Winston,” Artificial Intelligence”, 3rd Edition, AW, 1999.
Nils.J.Nilsson, “Principles of Artificial Intelligence”, Narosa Publishing House, 1992.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	3	2	2									3	2
CO2	3	2	1									2	3
CO3	3	3	2	1								3	2
CO4	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 II-SEMESTER CSE[DS]

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3	1	0	4

20ACD49 - ARDUINO PROGRAMMING FOR IoT
[HONORS DEGREE – POOL III]

COURSE OUTCOMES:

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

1. Describe the basics of sensors, its functioning.
2. Explain basic and advanced assembly language programs.
3. Use the interface for I/O devices with processor for task sharing.
4. Analyze the functionality of micro controller, latest version processors and its applications.

UNIT 1: INTRODUCTION TO SENSORS **9**

Transducers, Classification, Roles of sensors in IOT, Various types of sensors, Design of sensors, sensor architecture, special requirements for IOT sensors, Role of actuators, types of actuators.

UNIT 2: HARDWARE **9**

Physical device Arduino Interfaces, Hardware requirement for Arduino, Connecting remotely over the network using VNC, GPIO Basics, Controlling GPIO Outputs Using a Web Interface, Programming, APIs / Packages- Quark SOC processor, programming, Arduino Boards using GPIO (LED, LCD, Keypad, Motor control and sensor)

UNIT 3: PLATFORMS **9**

History - Creative Coding Platforms - Open-Source Platforms PIC - Arduino, Sketch, Iterative coding methodology Python Programming - Mobile phones and similar devices - Arm Devices - Basic Electronics (circuit theory, measurements, parts identification) Sensors and Software: Understanding Processing Code Structure, variables and flow control, Interfacing to the Real World

UNIT 4 PROGRAMMING AN ARDUINO IOT DEVICE **9**

Preparing the development environment (Arduino IDE), Exploring the Arduino language (C/C++) syntax, Coding, compiling, and uploading to the microcontroller, Working with Arduino Communication Modules: Bluetooth Modules, WiFi Modules and I2C and SPI, Interfacing arduino and Blynk via USB : LED Blinking, Controlling a Servomotor.

UNIT 5 PROGRAMMING ESP 8266 MODULE **9**

ESP8266 WiFi Serial Module: Overview, Setting Up the Hardware, Interfacing with Arduino, Creating an IoT Temperature and Humidity Sensor System, Overview of DHT-22 Sensor, Interfacing the Hardware: Arduino, ESP8266 WiFi Module, and DHT-22 Sensor, Checking Your Data via ThingSpeak, Connecting Your Arduino Set-up to Blynk via WiFi

Max=45Hrs

TEXT / REFERENCES BOOKS

1. Intel Galileo and Intel Galileo Gen 2API Features and Arduino Projects for Linux Programmers,

Ramon, Manoel 2014 (Open
Access)
2. Making Sense of Sensors: End-to-End Algorithms and Infrastructure Design By OmeshTickoo, Ravi Iyer 2016
3. Programming Interactivity, Second Edition By Josha Noble, 2012.

CO-PO Mapping:

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

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20ACD50 - MOBILE AND PERVASIVE COMPUTING
[HONORS DEGREE – POOL IV]

OUTCOMES:
Upon completion of this course the students should be able to:

- Explain the latest 4G Telecommunication System Principles.
- Incorporate the pervasive concepts.
- Implement the HCI in Pervasive environment.
- Apply the pervasive concepts in mobile environment.

UNIT I INTRODUCTION **9**

History – Wireless communications: GSM – DECT – TETRA – UMTS – IMT – 2000 – Bluetooth, WiFi, WiMAX, 3G, WATM. - Mobile IP protocols -WAP push architecture-Wml scripts and applications. Data networks – SMS – GPRS – EDGE – Hybrid Wireless100 Networks –ATM – Wireless ATM.

UNIT II OVERVIEW OF A MODERN 4G **9**

Introduction. LTE-A System Architecture. LTE RAN. OFDM Air Interface. Evolved Packet Core. LTE Requirements. LTE-Advanced. LTE-A in Release. OFDMA – Introduction. OFDM Principles. LTE Uplink—SC-FDMA. Summary of OFDMA.

UNIT III PERVASIVE CONCEPTS AND ELEMENTS **9**

Technology Trend Overview - Pervasive Computing: Concepts - Challenges - Middleware - Context Awareness - Resource Management - Human–Computer Interaction - Pervasive Transaction Processing - Infrastructure and Devices - Wireless Networks - Middleware for Pervasive Computing Systems - Resource Management - User Tracking- Context Management -Service Management - Data Management - Security Management - Pervasive Computing Environments

UNIT IV HCI IN PERVASIVE COMPUTING **9**

Prototype for Application Migration - Prototype for Multimodalities - Human–Computer Interface in Pervasive Environments - HCI Service and Interaction Migration – Context Driven HCI Service Selection - Interaction Service Selection Overview - User Devices - Service-Oriented Middleware Support - User History and Preference - Context Manager - Local Service Matching - Global Combination - Effective Region - User Active Scope - Service Combination Selection Algorithm

UNIT V PERVASIVE MOBILE TRANSACTIONS **9**

Pervasive Mobile Transactions - Introduction to Pervasive Transactions - Mobile Transaction Framework - Unavailable Transaction Service - Pervasive Transaction Processing Framework - Context-Aware Pervasive Transaction Model - Context Model for Pervasive Transaction Processing - Context-Aware Pervasive Transaction Model - A Case of Pervasive Transactions - Dynamic Transaction Management - Context-Aware Transaction Coordination Mechanism - Coordination Algorithm for Pervasive Transactions - Participant Discovery - Formal Transaction Verification - Petri Net with Selective Transition.

TOTAL :45 PERIODS

REFERENCES:

1. Alan Colman, Jun Han, and Muhammad Ashad Kabir, Pervasive Social Computing Socially-Aware Pervasive Systems and Mobile Applications, Springer, 2016.
2. J.Schiller, ―Mobile Communication‖, Addison Wesley, 2000.
3. Juha Korhonen, ―Introduction to 4G Mobile Communications‖ , Artech House Publishers, 2014
4. Kolomvatsos, Kostas, Intelligent Technologies and Techniques for Pervasive Computing, IGI Global, 2013.
5. M. Bala Krishna, Jaime Lloret Mauri, ―Advances in Mobile Computing and Communications: Perspectives and Emerging Trends in 5G Networks‖, CRC 2016
6. Minyi Guo, Jingyu Zhou, Feilong Tang, Yao Shen, ― Pervasive Computing: Concepts,Technologies and Applications ‖ CRC Press, 2016.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	3	2	2									3	2
CO2	3	2	1									2	3
CO3	3	3	2	2								3	2
CO4	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 II-SEMESTER CSE[DS]

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20ACD51 - DESIGN AND DEVELOPMENT OF BLOCKCHAIN
[HONORS DEGREE – POOL IV]

COURSE OUTCOMES

- Explain the emerging technology in blockchain
- Use the component and structure of blockchain
- Deals to work with various decentralized blockchain
- Familiar with Ethereum wallet and smart contract
- Design and develop own blockchain for a real time application

UNIT1 BLOCKCHAIN BASICS 9

Basics of Crypto economics- Blockchain – Cryptocurrencies overloaded –Blockchain in Nutshell: Benefits and Challenges – Blockchain types - Blockchain Peer to Peer Network: Consensus Mechanisms, Proof of Work, Proof of Stake, Mining Layer, Propagation Layer, Semantic Layer, Application Layer

UNIT2 COMPONENETS AND STRUCTURE OF BLOCKCHAIN 9

Blocks – Chain between the blocks – Digital signatures and Hashing – Block data examples: Bitcoin block, Ethereum block, Block time and Block size, Global Size – Blockchain miners and validators – Blockchain speed: Blockchain throughput and comparison with traditional network

UNIT 3 DECENTRALIZATION USING BLOCKCHAIN 9

Methods of decentralization – Routes to decentralization – Blockchain and full ecosystem decentralization: Computation, Storage, Communication and decentralization – Smart Contracts – Organization of decentralization: Decentralized Autonomous: Organizations, Corporations, Societies, DApps and their requirements, Operations of DApps – Example of DApps: KYC-Chains, Open Bazzar, Lazooz

UNIT 4 CREATING AN OWN BLOCK CHAIN 9

Creating: Basic P2P network, Genesis Blocks and Sharing Blocks – Registering Miners and Creating new blocks – Storing blocks –Creating: Blockchain wallet, API, Command Line Interface – Blockchain Wallet and Transaction: Wallet, Transaction and Colored Coins

UNIT 5 ETHEREUM WALLET & SMART CONTRACT 9

Ganache Full node Client – Intellij Plugin for Solidity – Truffle Suite: Create your Smart Contract – Connect Truffle to Smart Contract –Smart Contract: Hello world, MD5 Smart Contract, Smart Contract with truffle, Deploy the Smart Contract to your deployment network – Truffle Console – Operation with your Smart Contract via the Truffle CLI – Cryptocurrency Mining: Mining Hardware, Miner Types, Mining Pools, Mining Software

Max. 45 Hrs.

TEXT /REFERENCE BOOKS

1.EladElrom,"The Blockchain Developer A Practical Guide for Designing, Implementing, Publishing, Testing, and Securing Distributed Blockchain-based Projects",Apress (2019)
2.Brenn Hill, Samanyu Chopra, Paul Valencourt, Narayan Prusty, "Blockchain Developer's Guide Develop Smart Applications with Blockchain Technologies - Ethereum, JavaScript, Hyperledger Fabric, and Corda",Packt Publishing (2018)
3.Salman A. Baset, Luc Desrosiers, Nitin Gaur, Petr Novotny, Anthony O'Dowd, Venkatraman Ramakrishna, "Hands-On Blockchain with Hyperledger Building Decentralized Applications with Hyperledger Fabric and Composer", Packt Publishing (2018)

CO-PO Mapping:

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

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3	1	0	4

20ACD52 - RECONFIGURABLE COMPUTING
[HONORS DEGREE – POOL IV]

COURSE OUTCOMES:
Upon completion of the course, the students should be able to:

- Identify the need for reconfigurable architectures.
- Build basic modules using any HDL.
- Develop applications using any HDL and appropriate tools.
- Design and build an SoPC for a particular application.

UNIT I DEVICE ARCHITECTURE **9**
General Purpose Computing Vs Reconfigurable Computing – Simple Programmable Logic Devices – Complex Programmable Logic Devices – FPGAs – Device Architecture - Case Studies.

UNIT II RECONFIGURABLE COMPUTING ARCHITECTURES **9**
Reconfigurable Processing Fabric Architectures – RPF Integration into Traditional Computing Systems – Reconfigurable Computing Systems – Case Studies – Reconfiguration Management.

UNIT III PROGRAMMING RECONFIGURABLE SYSTEMS **9**
Compute Models - Programming FPGA Applications in HDL – Compiling C for Spatial Computing – Operating System Support for Reconfigurable Computing.

UNIT IV MAPPING DESIGNS TO RECONFIGURABLE PLATFORMS **9**
The Design Flow - Technology Mapping – FPGA Placement and Routing – Configuration Bitstream Generation – Case Studies with Appropriate Tools.

UNIT V APPLICATION DEVELOPMENT WITH FPGAS **9**
Case Studies of FPGA Applications – System on a Programmable Chip (SoPC) Designs.

TOTAL: 45 PERIODS

TEXT BOOKS /REFERENCES:
1. Christophe Bobda, ―Introduction to Reconfigurable Computing – Architectures, Algorithms and Applications‖, Springer, 2010.
2. Maya B. Gokhale and Paul S. Graham, ―Reconfigurable Computing: Accelerating Computation with Field-Programmable Gate Arrays‖, Springer, 2005.
3. FPGA Frontiers: New Applications in Reconfigurable Computing, 2017, Nicole Hemsoth, Timothy Prickett Morgan, Next Platform.
4. Reconfigurable Computing: From FPGAs to Hardware/Software Codesign 2011 Edition by Joao Cardoso (Editor), Michael Hübne, Springer
5. Scott Hauck and Andre Dehon (Eds.), ―Reconfigurable Computing – The Theory and Practice of FPGA-Based Computation‖, Elsevier / Morgan Kaufmann, 2008.

CO-PO Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
[AUTONOMOUS]
III B. TECH II-SEMESTER CSE[DS]

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3	1	0	4

20ACD53 - FIREWALL AND NETWORK PROTECTION
[HONORS DEGREE – POOL IV]

COURSE OUTCOME

On completion of the course, student will be able to

- Demonstrate system security skills through firewall implementation and testing.
- Use system tools, practices and relevant technologies to implement a security plan
- Evaluate practices, tools and technologies to identify security sources of attacks and protect mission critical systems.
- Apply appropriate level of security based on an analysis of security logs.
- Analyze relevant tools to secure a network, respond to and follow up on various types of attacks.

UNIT 1 NETWORK SECURITY **9Hrs.**

Concepts of system security - security services and mechanisms - security attacks - network security - protection methods - network concepts - threats in networks - network security controls.

UNIT 2 SYMMETRIC AND PUBLIC KEY ENCRYPTION **9Hrs.**

Symmetric Cipher model- substitution and transposition techniques -Data encryption standard (DES) algorithm, Double and Triple DES - Advanced encryption standard (AES) algorithm - Comparison of AES and DES - RSA algorithm - Diffie-Hellman Key Exchange - Digital signatures - certificates

UNIT 3 INTERNET SECURITY **9Hrs.**

Cloud security - transport level security - wireless network security - Electronic mail security - IP security - web security - IOT security.

UNIT 4 MALICIOUS SOFTWARE **9Hrs.**

Types of malicious software - viruses, worms, SPAM, Trojans, system corruption, Zombie, Bots, keyloggers, Phishing, Spyware, Backdoors, Rootkits - Distributed Denial of service attacks - IP spoofing attacks - case study (cryptographic solutions).

UNIT 5 INTRUSION DETECTION AND FIREWALLS **9Hrs.**

Intruders - intrusion detection - password management - Need for Firewalls - characteristics - types of firewalls - firewall basing - firewall location and configurations.

TOTAL=45Hrs

TEXT BOOKS

1. Cryptography and Network Security: Principles and Practice, 6th Edition, William Stallings, 2014, Pearson, ISBN13:9780133354690.
2. “Cryptography & Network Security”, Tata Mc Graw Hill by Atul Kahate
3. “Cryptography & Network Security”, McGraw-Hill by Behrouz Forouzan

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	3	3	3									2	2
CO2	3	2	1									2	1
CO3	3	2	2	1								3	3
CO4	3	2	1									3	1
CO5	3	3	1	1								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[DS]

L	T	P	C
3	1	0	4

20ACD54- DIGITAL MARKETING ANALYTICS
[HONORS DEGREE – POOL V]

COURSE OUTCOMES

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

- Relate to digital media marketing and the need for analytics on the data captured.
- Choose the appropriate tools for performing different digital analytics on the digital marketing data.
- Analyze and appraise the outcomes of digital influence and listening.
- Formulate a research plan and perform search analysis on the digital marketing data.
- Summarize the strategies for Mobile analytics and Business Intelligence

UNIT 1 DIGITAL MEDIA AND ANALYTICS 9

Digital media types – Owned and earned social metrics – Paid searches and Organic Searches - Aligning Digital and Traditional Analytics – Identifying social media listening tools – Understanding social media engagement software – Social media engagement tools.

UNIT 2 TOOLS FOR DIGITAL ANALYTICS 9

Social Media Listening Tools - Evolution, Social analytics life cycle, Social media monitoring software: Sysomos, Radian6, Visible Technologies, Zoho social and others. Search Analytics Tools – Basics of search, Search analytics use cases, Search data, Google trends, YouTube trends, Google Adwords keyword, Yahoo clues, Collecting insights through search data. Audience Analysis Tools – Audience Analysis Use Cases, Audience analysis tool types – Audience analysis Techniques, Event Triggers. Content Analysis Tools - Content Audits-Optimizing Content Distribution, Analysing Content Consumption.

UNIT 3 DIGITAL INFLUENCE AND LISTENING 9

Reality of Digital Influence - Media List - Klout, PeerIndex - Online Versus Offline Influence - Using the Influencer List - Developing Social Media Listening Program - Using Listening Data for Program Planning - Implementing Listening Program - Conversation Audit - Online Influencers - Conducting Social brand benchmarking - Use of Online data for crisis anticipation - Identifying known issues - Crisis day monitoring and ongoing reporting - Corrections after crisis - Improving customer service.

UNIT 4: RESEARCH PLAN AND SEARCH ANALYSIS 9

Launching new product – Product life cycle – Introduction Phase – Growth Phase – Maturity Phase. Formulating research plan – Developing source list – Research methods – Constructing reports – Delivering reports – Report use cases – Building central repository of information – Search analytics for digital strategy – Search analytics for content strategy and planning – Search analytics for paid advertising.

UNIT 5 ROI, MOBILE ANAYTICS AND BUSINESS INTELLIGENCE 9

Return on Investment (ROI) – Return on Engagement, Influence, Experience – Tracking ROI – Understanding measurement fundamentals – Measurement reporting cadence - Mobile Analytics –Mobile market landscape – Mobile marketing measurement – Marketing activities – Audience/visitor metric – Mobile app performance - Social CRM – Social CRM initiative – Social CRM Initiative - Future of Digital Data – Business Intelligence.

TOTAL=45Hrs

TEXT BOOKS

1. Chuck Hemann and Ken Burbary, "Digital Marketing Analytics: Making Sense of Consumer Data in a Digital World", Que Publishing, 1 edition, ISBN-13: 978-0789750303, 2013.

REFERENCE BOOKS

1. Simon Kingsnorth, "Digital Marketing Strategy: An Integrated Approach to Online Marketing", Kogan Page Publisher, First edition, ISBN-13: 978-0749474706, 2016.

2.Dave Chaffey, Fiona Ellis-Chadwick, "Digital Marketing – Strategy, Implementation and Practice", Pearson Education, Sixth edition, ISBN-13: 978-1292077611, 2016.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**3**									**2**	**2**
CO2	**3**	**2**	**1**									**3**	**1**
CO3	**3**	**2**	**2**	**1**								**3**	**3**
CO4	**3**	**2**	**1**	**1**								**3**	**1**
CO5	**3**	**3**	**1**									**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[DS]

L	T	P	C
3	1	0	4

20ACD55 - PRACTICAL CASE STUDY ON DATA SCIENCE
[HONORS DEGREE – POOL V]

COURSE OUTCOMES

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

- Build the Model to predict the probability of the bank-loan defaulters
- Develop the Model of Sales Forecasting for Gen Retailers
- Implement the Decision Tree Model to Predict the Customer Churn
- Predict the Probability of Malignant and Benign Breast Cancer with Random Forest Model

UNIT 1: BANKING CASE STUDY **8**

Data Analytics-Types of Analytics-Understanding Data and Its Types-Data Analytics and Big Data Tools-Role of Analytics in Various Industries-Analytical Competitors-Key Models and Their Applications in Various Industries-Banking Case Study-Applications of Analytics in the Banking Sector-Predicting Bank-Loan Default-Predicting Fraudulent Activity-Logistic Regression Model-Logistic Regression Model Using R.

UNIT 2: RETAIL CASE STUDY **8**

Supply Chain in the Retail Industry-Types of Retail Stores-Role of Analytics in the Retail Sector-Customer Engagement-Supply Chain Optimization-Price Optimization-Space Optimization and Assortment Planning-Overview of ARIMA Model-Three Steps of ARIMA Modelling-Seasonal ARIMA Model Using R

UNIT 3: TELECOMMUNICATION CASE STUDY **9**

Types of Telecommunications Networks-Roles of Analytics in the Telecommunications Industry Predicting Customer Churn-Network Analysis and Optimization-Fraud Detection and Prevention-Price Optimization-Decision Tree Model Using R.

UNIT 4: HEALTHCARE CASE STUDY **10**

Application of Analytics in the Healthcare Industry-Predicting the Outbreak of Disease and Preventative Management-Predicting the Readmission Rate of the Patients-Healthcare Fraud Detection-Improve Patient Outcomes & Lower Costs-Working of Random Forest Algorithm-Random Forests Model Using R

UNIT 5: AIRLINE CASE STUDY **10**

Application of Analytics in the Airline Industry-Personalized Offers and Passenger Experience-Safer Flights-Airline Fraud Detection-Predicting Flight Delays-Multiple Linear Regression Assumptions and Checking for Violation of Model Assumptions-Multiple Linear Regression Model Using R.

TOTAL=45Hrs

TEXT BOOKS / REFERENCE BOOKS

1. Deepti Gupta," Applied Analytics through Case Studies Using SAS and R", Asia-Pacific Holdings Private Limited,2018

1.Deborah Nolan, Duncan Temple Lang,"Data Science in R: A Case Studies Approach to Computational Reasoning and Problem Solving", CRC Press,2015

2.Kerrie Mengersen,PierrePudlo,Christian Robert P.," Case Studies in Applied Bayesian Data Science", Springer International Publishing,2020.
3. Danish Haroon,"Python Machine Learning Case Studies", Apress,2017
4.Peter Haber,ThomasLampolt shammer, Manfred Mayr "Data Science – Analytics and Applications", Springer Vieweg,2019.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**1**									**3**	
CO2	**3**	**2**	**1**									**3**	**2**
CO3	**3**	**3**	**2**									**2**	**3**
CO4	**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 CSE[DS]

L	T	P	C
3	1	0	4

20ACD56 - WEB SERVICES AND API DESIGN
[HONORS DEGREE – POOL V]

OUTCOMES:
At the end of the course, the student should be able to:
- Explain suitable architecture for a given design problem
- Use the types of resources and suitable design patterns for development and deployment
- Apply RESTful API web services using JAVA
- Implement security best practices for preventing security attacks

UNIT I INTRODUCTION **9**
Web Services - Building Blocks, Types; Service Oriented architectures - resource oriented architectures, API architectures, Micro services and architectures, HATEOAS, REST, URI, Code on Demand.

UNIT II RESOURCES AND DESIGN PATTERNS **9**
Resources - Identification, Resource Relations, Representations, Parameters, types, methods, Requirements for APIs, Architectural Patterns. Basic and Advanced RESTful API patterns.

UNIT III RESTFUL API DESIGN PRINCIPLES **9**
API front End Design, API back-end Design, Identifier Design, Interaction Design with HTTP, Metadata Design, Representation Design, URI design, REST constraints, Best Practices.

UNIT IV DEVELOPMENT AND DEPOLYMENT **9**
Frameworks, Standard Languages, API Description Languages, Handover points, Development and Deployment of RESTful web service applications in Java, microservice API, Best Practices.

UNIT V PERFORMANCE AND SECURITY **9**
Performance and availability - caching - Traffic shaping - Evolution and versioning, Security concerns - Mechanisms, Authentication, Validation, Access Control, Token Based Authentication, Authorization.

TOTAL:45 PERIODS

TEXT BOOK:
1. Matthias Biehl, “RESTful API Design, API University Series, 1st Edition, CreateSpace Independent Publishing Platform, 2016.
2. Mark Masse, “REST API Design Rulebook: Designing Consistent RESTful Web Service Interfaces”, 1st Edition, O’ Reilly, 2011.
3. Harihara Subramanian, Pethuru Raj, “Hands-On RESTful API Design Patterns and Best Practices: Design, develop, and deploy highly adaptable, scalable, and secure “RESTful web APIs”, Packt Publishing, 2019

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**3**									**2**	**2**
CO2	**3**	**2**	**1**									**2**	**1**
CO3	**3**	**2**	**2**									**3**	**3**
CO4	**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[DS]

L	T	P	C
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20ACD57 - VULNERABILITY ANALYSIS AND PENETRATION TESTING
[HONORS DEGREE – POOL V]

OUTCOMES:
At the end of the course, the student should be able to:

- Explain the testing phases of penetration testing
- Use gathering methodology for social engineering attacks
- Apply techniques to understand system hacking
- Analyze advanced hacking techniques

UNIT 1 INTRODUCTION 9
Penetration Testing phases/Testing Process, types and Techniques, Blue/Red Teaming, Strategies of Testing, Non-Disclosure Agreement Checklist, Phases of hacking, Open-source/proprietary Pentest Methodologies.

UNIT 2 INFORMATION GATHERING AND SCANNING 10
Information gathering methodologies- Foot printing, Competitive Intelligence 3DNS Enumerations- Social Engineering attacks, Port Scanning- Network Scanning Vulnerability Scanning- NMAP scanning tool- OS Fingerprinting- Enumeration.

UNIT 3 SYSTEM HACKING 9
Password cracking techniques- Key loggers- Escalating privileges- Hiding Files, Double Encoding, Steganography technologies and its Countermeasures. Active and passive sniffing- ARP Poisoning, MAC Flooding- SQL Injection - Error based, Union-based, Time-based, Blind SQL, Out-of-band. SQL Injection Prevention Techniques.

UNIT 4 ADVANCED SYSTEM HACKING 8
Broken Authentication, Sensitive Data Exposure, XML External Entities, Broken Access Code, XSS - Stored, Reflected, DOM Based.

UNIT 5 WIRELESS PENTEST 9
Wi-Fi Authentication Modes, Bypassing WLAN Authentication, Types of Wireless Encryption, WLAN Encryption Flaws, AP Attack, Attacks on the WLAN Infrastructure, DoS-Layer1, Layer2, Layer 3, DDoS Attack, Client Misassociation, Wireless Hacking Methodology, Wireless Traffic Analysis.

Max. 45 Hrs.

TEXT / REFERENCE BOOKS

1.Kali Linux Wireless Penetration Testing Beginner's Guide by Vivek Ramachandran, Cameron Buchanan,2015 Packt Publishing
2.SQL Injection Attacks and Defense 1st Edition, by Justin Clarke-Salt, Syngress Publication
3.Mastering Modern Web Penetration Testing By Prakhar Prasad, October 2016 Packt Publishing.
4.Kali Linux 2: Windows Penetration Testing, By Wolf Halton, Bo Weaver, June 2016 Packt Publishing.
5.Kali Linux Revealed: Mastering the Penetration Testing Distribution - June 5, 2017, by Raphael Hertzog (Author), Jim O'Gorman (Author), Offsec Press Publisher.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO11	PO12	PSO1	PSO2
CO1	3	3	1									3	
CO2	3	2	1									3	2
CO3	3	3	2									2	3
CO4	3	3	2									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- (Common to CSE, CSE(DS), CSE(AIML), IT)

L	P	T	C
3	1	-	4

20ACS73 FUNDAMENTALS OF BLOCK CHAIN

Course Outcomes:

After Completion of the course the student will be able to

1. Familiarize the functional/operational aspects of cryptocurrency ECOSYSTEM.
2. Understand emerging abstract models for Block chain Technology.
3. Identify major research challenges and technical gaps existing between theory and practice in cryptocurrency domain

UNIT I **8 hrs**

The consensus problem - Asynchronous Byzantine Agreement - AAP protocol and its analysis - Nakamoto Consensus on permission-less, nameless, peer-to-peer network - Abstract Models for BLOCKCHAIN - GARAY model - RLA Model - Proof of Work (PoW) as random oracle - formal treatment of consistency, liveness and fairness - Proof of Stake (PoS) based Chains - Hybrid models (PoW + PoS) .

UNIT II **7 hrs**

cryptographic basics for cryptocurrency - a short overview of Hashing, signature schemes, encryption schemes and elliptic curve cryptography

UNIT III **9 hrs**

Bitcoin - Wallet - Blocks - Merkley Tree - hardness of mining - transaction verifiability - anonymity - forks - double spending - mathematical analysis of properties of Bitcoin.

UNIT IV **7 hrs**

Ethereum - Ethereum Virtual Machine (EVM) - Wallets for Ethereum - Solidity - Smart Contracts - some attacks on smart contracts.

UNIT V **7 hrs**

Zero Knowledge proofs and protocols in Blockchain - Succinct non interactive argument for Knowledge (SNARK) - pairing on Elliptic curves - Zcash.

TEXT BOOKS:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press, 2016.

REFERENCE BOOKS:

1. Joseph Bonneau et al, SoK: Research perspectives and challenges for Bitcoin and cryptocurrency, IEEE Symposium on security and Privacy, 2015

2. J.A.Garay et al, The bitcoin backbone protocol - analysis and applications EUROCRYPT 2015 LNCS VOl 9057, (VOLII), pp 281-310.

3. R.Pass et al, Analysis of Blockchain protocol in Asynchronous networks, EUROCRYPT 2017, (eprint.iacr.org/2016/454) .

4. R.Pass et al, Fruitchain, a fair blockchain, PODC 2017 (eprint.iacr.org/2016/916).

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

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, CSE(DS), CSE(AIML), IT)

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	PSO3
C01	3	2	2	-	-	-	-	-	-	-	-	-	2	3	3
C02	3	2	1	2	-	-	-	-	-	-	-	-	2	2	2
C03	3	2	3	-	1	-	-	-	-	-	-	-	2	2	3
C04	3	2	2	1	1	-	-	-	-	-	-	-	2	1	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

	L	T	P	C
	3	1	-	4

20ACS75 **BLOCKCHAIN PLATFORMS AND USE CASES**
(Minor Degree)

Course Outcomes: After completion of course, students would be able to:

1. Analyse different types of blockchain platforms.
2. Understand different types of uses of blockchain and apply it to some real-life scenarios accordingly.
3. Acquire knowledge of the shortcomings of blockchain technology and their corresponding solutions.

UNIT-I: Introduction to Blockchain: **9hrs**

Various technical definition of Blockchain, Generic Elements of Block chain , Feature of Blockchain, Types of Blockchain: Public blockchains, private block chains semi-private blockchains, sidechains, Permissioned ledger, Distributed ledger, Shared ledger, Fully private and proprietary blockchains.

Unit-II: Decentralized Application Platforms: 9**hrs**

Decentralization using blockchain, Methods of decentralization, Route of decentralization Blockchain and full ecosystem decentralization, Decentralized organization, Decentralized applications.

Platforms for decentralization,

Unit-III: Blockchain Platforms: 9hrs

Bitcoin, Bitcoin definition, transaction. Blockchain, The bitcoin network, Wallets, wallet types, Non-deterministic wallets, deterministic wallets, hierarchical determistic wallets, Brain wallets, Paper wallets, Hardware wallets, Online wallets, Mobile wallets.

Unit-IV: Alternative Blockchain: 9**hrs**

Kadena, Ripple, transaction, Stellar, Rootstock, Quorum; transaction manager, crypto enclave, Quorumchain, Network manager, Tezos: StorJ, Maidsafe, BigchainDB, Tendermint.

Unit-V: Blockchain Use Cases: 9**hrs**

Financial Services Related Use Cases, Multinational policy management, Government, Supply Chain Management, Healthcare Related Services: Electronic medical records, Healthcare payment preauthorization,

Text Books/References:

1. Tiana Laurence, Blockchain for Dummies, 2nd Edition 2019, John Wiley & Sons.

2. Anshul Kaushik, Block Chain & Crypto Currencies, Khanna Publishing House.

3. Building Blockchain Projects, Narayan Prusty, Packt Publishing.

4. Mastering Blockchain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Blockchain frameworks by Imran Bashir, Packt Publishing (March 17, 2017).

5. Blockchain: Blueprint for a New Economy by Melanie Swan, Shroff Publisher publisher/O'Reilly Publisher Media; 1st edition (2015).

	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	PSO 3
CO 1	3	3	2	-	-	-	-	-	-	-	-	-	3	3	2
CO 2	2	2	2	1	1	-	-	-	-	-	-	-	2	2	3
CO 3	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

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 9Hrs

Security Issues

Blockchain Related Issues, Higher-Level Language (Solidity) Related Issues, EVM Bytecode Related Issues, Real-Life Attacks on Blockchain Applications/ Smart Contracts, Trusted Execution Environments

Unit-II 9Hrs

Security Tools for Smart Contracts

Working, Advantages, And Disadvantages of Tools- Oyente, Securify, Maian, Manticore, Mythril, SmartCheck, Verx. Secure Key Management, Quantum Resilience Keys.

Unit-III 9Hrs

Performance Related Issues

Transaction Speed, Transaction Fees, Network Size, Complexity, Interoperability Problems, Lack of Standardization. Lack of Supportive Regulations Related to Blockchain Applications.

Unit-IV 9Hrs

Performance Improvements

Off-Chain State Channels, Sidechains, Parallels Chains, Concurrent Smart Contract Transactions, Sharding Technique and Its Benefits, Atomic Swaps Between Smart Contracts

Unit-V 9Hr

Blockchain Applications

Decentralized Cryptocurrency, Distributed Cloud Storage, EVoting, Insurance Claims, Cross-Border Payments, Asset Management, Smart Appliances.

Text Books:

1. Mastering Ethereum: Building Smart Contracts and Dapps Book by Andreas Antonopoulos and Gavin Wood, Shroff Publisher/O′Reilly Publisher.

References Books:

1. Mastering Blockchain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Blockchain frameworks by Imran Bashir, Packt Publishing (March 17, 2017).

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	-	-	-	-	-	-	-	-	-	3	3	2
CO2	2	2	2	2	1	-	-	-	-	-	-	-	2	2	3
CO3	3	2	3	1	-	-	-	-	-	-	-	-	3	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech I Semester- (Common to CSE, CSE(DS), CSE(AIML), IT)

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.
4. Implement the concepts of decentralized markets

UNIT –I 12Hrs

Cryptocurrencies

Concept, Cryptocurrency Mining, Uses of Cryptocurrencies, Tokens, Token vs Crypto Coin, Concept of ICOs (Initial Coin Offerings), Benefits of Using ICOs, STOs (Security token offerings), ICO vs STO, Cryptocurrency wallets.

Unit -II 12Hrs

Decentralized Finance (DeFi)

Concept, Benefits and Risks Associated with DeFi, Centralized vs Decentralized finance, DeFi Projects, DeFi future trends.

Unit –III 12Hrs

Decentralized Markets

Concept of Decentralized markets, impact of decentralization on financial market, Decentralized Exchanges (DEX), Security, control and privacy concerns related to DEX, Liquidity and Usability of DEX, best DEXs for trading, Fund Management and Trading logic of DEX, Concept of Decentralized Web.

Unit –IV 12Hrs

Blockchain & Cryptocurrency Regulations

Introduction, History Stance of the Government, Judicial Approach to Cryptocurrency, Possible Reasons for Ban, Virtual Currency Regulations, Global Perspective of Regulations on Blockchain, Future needs for Regulations.

Unit –V 12Hrs

Blockchain in Banking Sector

Cross-Border Payments Using Blockchain and Its Benefits, Study of blockchain platforms used for cross-border payments, Impact of Blockchain on Banking Services. Stable Coin: Concept, Uses and Types of Stable Coins Case-Study: Tether and Libra Coins

Text Books

1. Melanie Swan, Blockchain: Blueprint for a new economy, Shroff Publisher/O'Reilly Publisher.

2. Ron Quaranta, Blockchain in Financial Markets and Beyond: Challenges and Applications, Risk Books Publisher.

3. Richard Hayen, Blockchain & FinTech: A Comprehensive Blueprint to Understanding Blockchain & Financial Technology. - Bitcoin, FinTech, Smart Contracts, Cryptocurrency, Risk Books Publisher.

Corresponding Online Resources:

1.https://www.accenture.com/in-en/insight-blockchain-technology-how-banks building-real-time

2. https://medium.com/search?q=decentralized%20exchange

3.Emerging Technology Projection: The Total Economic Impact™ Of IBM Blockchain https://www.ibm.com/downloads/cas/QJ4XA0MD

4. https://www.coursera.org/learn/cryptocurrency

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

Minors Degree in Web designing

Sri Venkateswara College of Engineering and Technology
(Autonomous)
II B.Tech II Semester- (Common to CSE, CSE(DS), CSE(AIML), IT)

L	T	P	C
3	1	-	4

20ACS78 HTML & CSS

Course Outcomes:

After Completion of the course the student will be able to

1. Analyze and apply the role of languages HTML, DHTML, database access in the working of the web and web applications.
2. Use internal and external cascading style sheets (CSS) to consistently format elements on a page or group of pages.
3. Ability to work with links exploring the URL and ability creating Hyperlinks, linking to mail system.
4. Create a table, adding title to a column, working with images, colors and canvas build dynamic web pages using HTML and CSS

UNIT-I 8 hrs

INTRODUCTION

Internet and Web, HTML, Javascript, CSS,XML,XHTML, Ajax,Php,HTML5 and its Elements, HTML5-Next generation web development, Structuring an HTML Document, creating and saving an HTML Documents, Validating an HTML Documents, Viewing an HTML Documents.

UNIT II 9 hrs

Understanding Elements, Describing Data Types, working with root and metadata elements, working with script and no script elements, working with section elements, working with header and footer elements, working with Headings , working with charter entities, Horizontal rules, line breaks, paragraphs ,working with Text: formatting Text with HTML Documents, Mark elements, strong elements, code, small elements.

UNIT III 8 hrs

Displaying Plain text, bold text, Italic text, small text, subscripted text, Inserted text, Deleted text, variables and arguments using VAR elements, Organizing Text in HTML: arranging Text, Displaying List, Working with links: Exploring the Hyperlinks, Exploring the URL, Exploring the newsgroup and mail system, Link relation, creating Hyperlinks, linking to mail system.

UNIT IV 8 hrs

Creating tables : Understand tables, Describing the Table Elements, creating simple table, adding title to a column, adding caption to a table, specifying properties of the column, spanning rows and columns, working with images, colors and canvas : inserting images in a web pages, Exploring colors .

UNIT V

7 hrs

Evolution of CSS, syntax of CSS, Exploring CSS sectors, inserting CSS sectors in HTML Doc, Exploring background of webpage, Exploring color properties ,understanding fonts, exploring font properties, web fonts.

Text Books:

1.DT Editorial Service ," HTML 5 Black Book, Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and jQuery, 2ed 2016 , Dream Tech Press .

Reference books:

1. M. Deitel, P.J. Deitel, A. B. Goldberg ,Internet& World Wide Web How to H program, 3 rd Edition, Pearson Education, 2004.

2. Ellie Quigley, Marko Gargenta,"PHP and MySQL" , Prentice Hall(Pearson),2006

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

Minor Degree in web Designing

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

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:

2. Programming PHP, Rasmus Lerdorf, Kevin.T and Peter M., 2013, 3rd Edition, O'Reilly, USA.

REFERENCE BOOKS:

1. Luke Welling, Laura Thomson, "PHP and MySQL Web Development", 5th Edition, Pearson Education, 2016. ISBN: 978-9332582736.
2. PHP and MySQL, PHP and MySQL in easy steps, 2nd edition, 2017, ISBN: 9789386551405.
3. The Complete Reference PHP, Holzner, Steven, Indian Edition 2017.

CO-PO MAPPING

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

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

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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:

1. Adrian Holovaty, Jacob K. Moss, "Django The Definitive Guide to Django: Web Development Done ", www.djangobook.com

REFERENCE BOOKS:

1. Daniel Rubio, "Beginning Django Application Development and Deployment with Python", Apress.
2. 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	-	-	2	-	-	-	1	1	3
CO2	2	-	-	-	2	-	-	2	-	-	-	1	1	2
CO3	2	-	-	1	2	-	-	2	-	-	-	1	2	1
CO4	2	-	-	1	2	-	-	2	-	-	-	1	1	1
CO5	2	-	-	1	1	-	-	1	-	-	-	1	3	3

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, CSE(DS), CSE(AIML), IT)

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.
4. Comprehensive knowledge about technologies.

UNIT- I 12 Hrs

First React Web Application: Prepare the app, Building Product, Rendering multiple products, Propagating the event, Binding custom component methods, Updating state and immutability, Babel plugins and presets, Refactoring ProductList.

Components: Breaking the app into components, Build a static version of the app, Determine what should be stateful, Determine in which component each piece of state should live, Hard-code initial states, Add inverse data flow.

UNIT-II 12 Hrs

Components & Servers: The Server API, Playing with the API.

JSX and the Virtual DOM: React Uses a Virtual DOM, ReactElement, JSX.

Advanced Component Configuration with props, state, and children: ReactComponent, PropTypes, context, Stateful components, Stateless components, talking to Children Components with props.children.

UNIT-III 12 Hrs

Forms: Form Modules, Webpack basics, Using Create React App with an API server

Using Webpack with Create React App: JavaScript modules, Exploring Create React App,

Unit Testing: Using Jest, Testing strategies for React applications, Testing a basic React component with Enzyme, Writing tests for the food lookup app.

Routing: Building the components of react-router, Dynamic routing with React Router, Supporting authenticated routes.

UNIT-IV 12 Hrs

Intro to Flux and Redux: Flux implementations, Redux, Building a counter, Building the store, Building the reducer(), Subscribing to the store , Connecting Redux to React.

Intermediate Redux: Using createStore() from the redux library, Representing messages as objects in state, Introducing threads, Breaking up the reducer function.

UNIT-V 12 Hrs

Using Presentational and Container Components with Redux: Presentational and container components, generating containers with react-redux, Action creators.

Using GraphQL: GraphQL Benefits, Complex Types, Exploring a Graph.

TEXT BOOK:

1. Fullstack React: The Complete Guide to ReactJS and Friends, Ari Lerner, Anthony Accomazzo, Nate Murray, Clay Allsopp, 2017.

REFERENCE BOOKS:

2. Mastering Full-Stack React Web Development, Tomasz Dyl, Kamil Przeorski, Maciej Czarnecki, Packt Publishing Ltd, ISBN: 978-9332582736, 2017.
3. Learning React: Functional Web Development with React and Redux, 1st Edition, Alex Banks, Eve Porcello, 2017, O'Reilly, USA.
4. 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	-	-	-	3	-	-	3	-	-
C02	3	-	3	2	3	-	-	-	3	-	-	-	-	1
C03	3	3	2	2	-	-	-	-	-	3	-	-	-	-
C04	3	2	2	2	-	-	-	-	2	3	-	2	2	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester- (Common to CSE, CSE(DS), CSE(AIML), IT)

L	T	P	C
3	1	-	4

20ACS82 **FULL STACK DEVELOPMENT USING Node.js, Type script**

Course Outcomes:

After completion of the course the student will able to do

1. Understand the basics Node.js and getting started with Node.js
2. Understand the concepts of asvnc.js and callback features
3. Understand the fundamentals of Typescript
4. Understand the how the typescript runs in a browser and on a server.

UNIT I – Getting Started with Node.js 9

Hello world HTTP server – Hello world command line – Installing and running Node.js – Running a Node program – Hello world with express – Hello world basic routing – How to create key and certificate – TLS socket server – TLS socket client – Arduino communication with Node.Js

UNIT II - async.js 9

Syntax – Call async.parallel() with an object – Resolving multiple values - Call async.series() with an object – Async/Await – Introduction – Examples – Asynchronous programming – Introduction – Syntax – Callback function in JavaScript – Callback functions in Node.js – Try catch – Working possibilities.

UNIT III – Advanced Concepts in Node.js 9

Auto reload on changes – Avoid call back hell – Bluebird promises – Callback to promise – Cassandra Integration – CLI – Client server communication – Cluster module – Connect to Mongodb

UNIT IV – Typescript Language Features 9

Javas script is valid Typescript – Types – Operators – Functions – Interfaces – Classes – Generics – Code organization – The type system.

UNIT V – Advanced Concepts in Typescript 9

Object orientation in Typescript – Understanding the runtime – Running Typescript in a browser – Running Typescript on server – Exceptions, Memory and Performance – Using java script libraries – Automated testing.

TOTAL: 45 PERIODS

TEXT BOOKS:

2. Free Ebook, “Learning Node.js”, #node.js
3. Steve Fenton " Pro TypeScript Application-Scale JavaScript Development", Second Edition, Apress.

REFERENCE BOOK:

3. 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**	**-**	**-**	**-**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**1**	**1**	**2**
CO2	**2**	**-**	**-**	**-**	**2**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**2**	**3**
CO3	**2**	**-**	**-**	**1**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**1**	**1**	**1**
CO4	**2**	**-**	**-**	**1**	**2**	**-**	**-**	**2**	**-**	**-**	**-**	**1**	**3**	**2**

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

Minors Degree in Cyber Security

Sri Venkateswara College of Engineering and Technology
(Autonomous)
II B. Tech II Semester- (Common to CSE, CSE(DS), CSE(AIML), IT)

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.

CO-PO MAPPING:

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

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

Minor Degree in Cyber Security

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
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	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 10

Introduction to Information Hiding- Steganographic technique- Substitution Systems and Bitplane Tools - Transform Domain Technique - Spread Spectrum and Information Hiding - Statistical Steganography - - Distortion Techniques-Cover Generation Technique - Principles of Steganography- Frameworks for Secret Communication, Security of Steganography Systems, Information Hiding in Noisy Data, Adaptive Versus Nonadaptive Algorithms- Active and Malicious Attackers- Information Hiding in Written Text.

Unit II Introduction to Watermarking Techniques 10

Basic Watermarking Principles - Watermarking Applications - Requirements and Algorithmic Design Issues - Evaluation and Benchmarking of Watermarking Systems - A Survey of Current Watermarking Techniques - The Choice of Host Locations in the Cover: Cryptographic and

Psycho visual Aspects - The Choice of Workspace - Formatting the Watermark Bits - Merging the Watermark and the Cover - Optimization of the Watermark Receiver Extensions from Still Images to Video

UNIT III Digital Watermarking 10

Digital Watermarking- Digital Steganography- Differences between Watermarking and Steganography- Classification in Digital Watermarking- Classification Based on Characteristics- Classification Based on Applications-- Digital Watermarking Fundamentals- Spatial-Domain Watermarking, Frequency-Domain

Watermarking- The Fragile Watermark-The Block-Based -Robust watermarks. - Watermarking Attacks- Image Processing Attacks, Geometric Transformation. Cryptographic Attack, Protocol Attacks, Watermarking Tools.

UNIT IV Introduction to Digital Steganography 12

Types of Steganography- Applications of Steganography- Embedding Security and Imperceptibility- Examples of Steganographic Software- Steganalysis-Introduction and Terminology - Looking for Signatures-Detecting Hidden Information Extracting Hidden Information - Disabling Hidden Information- The Statistical Properties of Images- The Visual Steganalytic System- IQM-Based Steganalytic System- Learning Strategies- The Frequency-Domain Steganalytic System.

UNIT V Robustness of Copyright Marking Systems 10

Robustness of Copyright Marking Systems -Robustness Requirements -Signal Diminishment- Watermark Detector Failure-Counterfeiting Marks- Detection of the Watermark- System Architecture Issues- Court of Law Attacks.

Copyright on the Internet and Watermarking- Digital Copyright and Watermarking- Conflict of Copyright Laws on the Internet.

Text Books

1. Stefan Katzenbeisser, Fabien, A.P. Petitcolas., "Information Hiding Techniques for Steganography and Digital Watermarking", Artech House.
2. Frank Y. Shih., "Digital Watermarking and Steganography: Fundamentals and Techniques", CRC Press.(2nd edition)

Reference Books

1. Neil F. Johnson; Zoran Duric; Sushil Jajodia, "Information Hiding: Steganography and Watermarking - Attacks and Countermeasures", Springer.
2. Gregory Kipper, "Investigator's Guide to Steganography", Auerbach Publications.

CO- PO Mapping

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

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3	1	-	4

20ACS85 Security Policy and Governance

COURSE OBJECTIVES:

1. Understand the basic concepts of Policy Development and Guidelines.
2. To Learn about the Information classification and Information Governance.
3. Understand the concept of information Classification.
4. Study the concepts of Risk Management.
5. Introduce for Information Governance For Delivery Platforms

Unit I- Information Governance Concepts, Definitions, And Principles

Big Data Impact - Defining Information Governance - Failures in Information Governance- Form IG Policies, Then Apply Technology for Enforcement- Data Governance - Data Governance Strategy Tips - IT Governance - IT Governance Frameworks - Impact of a Successful IG Program- InformationGovernancePrinciples - Accountability is Key - Generally Accepted Recordkeeping Principles - Assessment and Improvement Roadmap - Information Security Principles - Privacy Principles - Who Should Determine IG Policies.

UNIT II-POLICY DEVELOPMENT (10)

Policy Definitions- Policy, Standards, Guidelines, and Procedures: Definitions and Examples - Policy Key Elements-Policy Format and Basic Policy Components-Policy Content Considerations Program Policy Examples.Topic-Specific Policy Examples - Business Goals versus Security Goals - Computer Security Objectives - Mission Statement Format - Allocation of Information Security Responsibilities (ISO 17799–4.1.3) - Mission Statement Examples - Support for the Mission Statement– standards.

UNIT III- INFORMATION CLASSIFICATION (12)

Introduction - Why Classify Information- What Is Information Classification? -Establish a Team - Developing the Policy -Resist the Urge to Add Categories -What Constitutes Confidential Information-Classification Examples-Declassification or Reclassification of Information-Information Classification Methodology-Authorization for Access - Information Asset Risk Planning and Management - The Information Risk Planning Process - Create a Risk Profile - Information Risk Planning and Management Summary – IG reference model - Information Security Management Metrics.

UNIT IV- THE INFORMATION RISK MANAGEMENT PROGRAMME (10)

The Information Risk Management - Risk Identification - Threat and Vulnerability Assessment - Risk Analysis and Risk Evaluation – Risk Treatment – Risk Reporting and Presentation.

UNIT V-INFORMATION GOVERNANCE FOR DELIVERY PLATFORMS (8)

Information Governance for E-Mailand Instant Messaging - Information Governance for SocialMedia - Information Governance for Mobile Devices - Information Governance for Cloud Computing–Leveraging and Governing Emerging Technologies.

Text Books

1. Information Governance: Concepts, Strategies, And Best Practices, Second Edition, Wiley Publications by Robert F. Smallwood
2. Information security Policies,Standards and procedures by Thomas R.Peltier CRC press
3. Information Security Governance: A Practical Developmentand Implementation Approach, Wiley Publications,2009 by KragBrotby
4. Information Risk Management: A Practitioner's Guide, Second edition, by David Sutton.

Reference Book

1. Information Security Governance, Springer, by S. H. Von Solms and R. Von Solms
2. IT Governance and Information Security: Guides, Standards and Frameworks, CRC Press, by Yassine Maleh, AbdelkebirSahid,MamounAlazab, Mustapha Belaissaoui.

CO- PO Mapping

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
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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
4. Articulate information security risks as business consequences

UNIT 1 **9 Hrs**

SECURITY BASICS: Information Security (INFOSEC) Overview: critical information characteristics – availability information states – processing security countermeasures education, training and awareness, critical information characteristics – confidentiality critical information characteristics – integrity, information states – storage, information states – transmission, security counter measures policy, procedures and practices, threats, vulnerabilities.

UNIT II 9 Hrs

Threats to and Vulnerabilities of Systems: definition of terms (e.g., threats, vulnerabilities, risk), major categories of threats (e.g., fraud, Hostile Intelligence Service (HOIS), malicious logic, hackers, environmental and technological hazards, disgruntled employees, careless employees, HUMINT, and monitoring), threat impact areas, Countermeasures: assessments (e.g., surveys, inspections), Concepts of Risk Management: consequences (e.g., corrective action, risk assessment), cost/benefit analysis of controls, implementation of cost effective controls, monitoring the efficiency and effectiveness of controls (e.g., unauthorized or inadvertent disclosure of information), threat and vulnerability assessment)

UNIT III 8Hrs

Security Planning: directives and procedures for policy mechanism, Risk Management: acceptance of risk (accreditation), corrective actions information identification, risk analysis and/or vulnerability assessment components, risk analysis results evaluation, roles and responsibilities of all the players in the risk analysis process, Contingency Planning/Disaster Recovery: agency response procedures and continuity of operations, contingency plan components, determination of backup requirements, development of plans

for recovery actions after a disruptive event, development of procedures for offsite processing, emergency destruction procedures, guidelines for determining critical and essential workload, team member responsibilities in responding to an emergency situation.

UNIT IV 8 hrs

POLICIES AND PROCEDURES: Physical Security Measures: alarms, building construction, cabling, communications centre, environmental controls (humidity and air conditioning), filtered power, physical access control systems (key cards, locks and alarms), Personnel Security Practices and Procedures: access authorization/verification (need to know), contractors, employee clearances, position sensitivity, security training and awareness, systems maintenance personnel, Administrative Security Procedural Controls: attribution, copyright protection and licensing , Auditing and Monitoring: conducting security reviews, effectiveness of security programs, investigation of security breaches, privacy review of accountability controls, review of audit trails and logs.\

UNIT V 10hrs

Operations Security (OPSEC): OPSEC surveys/OPSEC planning INFOSEC: computer security – audit, cryptography encryption (e.g., point to point, network, link), cryptography key management (to include electronic key), cryptography strength (e.g., complexity, secrecy, characteristics of the key) Case study of threat and vulnerability assessment.

TEXT BOOK:

1. Whitman & Mattord, Principles of Incident Response and Disaster Recovery, Course Technology ISBN:141883663X

2. (Web Link) http://www.cnss.gov/Assets/pdf/nstissi_4011.pdf

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

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SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech I Semester- (Common to CSE, CSE(DS), CSE(AIML), IT)

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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 securitymodels.
2. Understand the concepts of User Identification/Authentication and trusted computer systems inlevel 2 security models.
3. Classify the different design issues related to

a. Security Software and Secure Operating System
b. Secure DBMS and Security Packages
c. Statistical Database Protection & Intrusion Detection Systems

4. Understand the level 1 models for protection of new generation database systems specially for theprotection 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 Model for the Protection of Frame Based Systems A Model for the Protection of Object-Oriented Systems SORION Model for the Protection of Object-Oriented Databases

UNIT-V:

Models for the Protection of New Generation Database Systems -2: A Model for the Protection of New Generation Database Systems: the Orion Model ajodia and Kogan's Model A Model for the Protection of Active Databases Conclusions

TEXT BOOK:

1. Database Security by Castano Pearson Edition (lie) Database Security and Auditing: Protecting Data Integrity and Accessibility, 1st Edition, Hassan Afyouni, THOMSON Edition.

REFERENCE BOOK:

1. Database security by alfred basta, melissazgola, CENGAGE learning.

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