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

Course Structure & Scheme of Examination

II B.Tech I Semester-CSE (IOT) 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	0	0	3	40	60	100
2	PC	20ACS06	Computer Organization and Architecture	3	0	0	3	40	60	100
3	PC	20ACS07	Object Oriented programming through JAVA	3	0	0	3	40	60	100
4	PC	20AIT01	Automata & Compiler Design	3	0	0	3	40	60	100
5	PC	20ACS08	Relational Database Management Systems	3	0	0	3	40	60	100
6	PCLAB	20ACS09	Object Oriented Programming through JAVA Lab	0	0	3	1.5	40	60	100
7	PCLAB	20AIT02	Automata & Compiler Design Lab	0	0	3	1.5	40	60	100
8	PCLAB	20ACS10	Relational Database Management Systems Lab	0	0	3	1.5	40	60	100
9	SC	20ACS11	Android Application Development	1	0	2	2	40	60	100
10	MC	20AMB02	Universal Human Values-I	2	0	0-	Non-credit	100	00	100
11	AC	20AHS11	Quantitative Aptitude and Reasoning-I	2	0	0	Non-credit	-	-	-
12	20ANSS1/20ANCC1	NSS/NCC		0	0	2	Non-credit	-	-	-
TOTAL				**20**	**00**	**13**	**21.5**	**460**	**540**	**1000**

II B.Tech II Semester CSE (IOT) 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	20AHS13	Probability and Statistics	3	0	0	3	40	60	100
2	ES	20AHS14	Discrete Structures and Graph Theory	3	0	0	3	40	60	100
3	PC	20ACS12	Design and Analysis of Algorithms	3	0	0	3	40	60	100
4	PC	20ACS13	Operating Systems	3	0	0	3	40	60	100
5	PC	20AIT04	Software Engineering	3	0	0	3	40	60	100
6	ES/PCLAB	20ACS14	Design and Analysis of Algorithms lab	0	0	3	1.5	40	60	100
7	PCLAB	20ACS15	Operating Systems Lab	0	0	3	1.5	40	60	100
8	PCLAB	20AIT05	Software Engineering Lab	0	0	3	1.5	40	60	100
9	SC	20ACO01	UI design-Flutter	1	0	2	2	40	60	100
10	AC	20AHS15	Quantitative Aptitude and Reasoning -II	2	0	0	Non-credit	-	-	-
TOTAL				**18**	**00**	**11**	**21.5**	**360**	**540**	**900**

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

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

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

SRIVENKATESWARACOLLEGEOFENGINEERINGANDTECHNOLOGY (AUTONOMOUS)
DEPARTMENTOFCOMPUTERSCIENCEANDENGINEERING (INTERNET OF THINGS)

Course Structure & Scheme of Examination

III B.Tech. I Semester CSE (IOT) **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
		20ACO02	Sensors and Actuators							
		20AIT13	Software Project Management							
		20ACO03	Data Science for Engineers							
		20ACS21	Computer Graphics							
		20ACO04	IoT Automation							
5	OE/JOE	**Open Elective/Job Oriented Elective–I**		3	0	0	3	40	60	100
		20AEC31	Digital Logic Design							
		20AME18	Robotics and Artificial intelligence							
		20ACE35	Integrated Waste Management for Smart City							
		20ACS23	Social Network Analysis							
		20ACS24	Kivy-Interactive Applications and Games in Python							
6	PCLAB	20ACS25	Web Technologies Lab	0	0	3	1.5	40	60	100
7	PCLAB	20ACS26	Computer Networks Lab	0	0	3	1.5	40	60	100
8	SC	20AHS16	Advanced English Communication skills	1	0	2	2	40	60	100
9	MC	20AHS21	Indian Constitution	2	0	0	-	100	00	100
10	AC	20AHS17	Quantitative Aptitude and Reasoning -III	2	0	0	-	-	-	-
11	AC	20AHS18	French Language	2	0	0	-	-	-	-
		20AHS19	German Language							
		20AHS20	Japanese Language							
12	20ACO05/20ACO06		Summer Internship/Community Service Project	0	0	0	1.5	40	60	100
TOTAL				22	00	8	**21.5**	**460**	**540**	**1000**

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

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

III B.Tech, II Semester-CSE (IOT) **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	20ACO07	IoT communication Protocol	3	0	0	3	40	60	100
2	PC	20ACO08	Computer Vision and Robotics	3	0	0	3	40	60	100
3	PC	20ACO09	Programming for IoT Boards	3	0	0	3	40	60	100
4	PE	**Professional Elective Courses-II**		3	0	0	3	40	60	100
		20ACO10	Architecting Smart IoT Devices							
		20ACO11	Software Testing Methodologies							
		20ACO12	Data Analytics for IoT							
		20ACO13	Wireless Networks							
		20ACO14	Mobile Application Development for IoT							
5	OE/JOE	**Open Elective/Job Oriented Elective–II**		3	0	0	3	40	60	100
		20ACE36	Disaster Management							
		20AMB09	Intellectual Property Rights							
		20AME31	Operations Research							
		20ACM13	Business Intelligence							
		20ACS34	Machine Learning							
6	PCLAB	20ACO15	IoT communication Protocol Lab	0	0	3	1.5	40	60	100
7	PCLAB	20ACO16	Computer Vision and Robotics Lab	0	0	3	1.5	40	60	100
8	PCLAB	20AC017	Programming for IoT Boards Lab	0	0	3	1.5	40	60	100
9	SC	20AIT19	Introduction to Programming and Animation with alice	1	0	2	2	40	60	100
10	MC	20AHS23	Essence of Indian Traditional Knowledge	2	0	0	-	100	-	100
TOTAL				18	0	11	**21.5**	**460**	**540**	**1000**

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

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

		L	T	P	C
20AHS10	**NUMERICAL METHODS**	**3**	**0**	**0**	**3**

Course Outcomes:

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

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

UNIT-I **10 Hours**

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

UNIT-II **8 Hours**

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

UNIT-III **10 Hours**

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

UNIT-IV **8 Hours**

NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS: Taylor's series-Picard's method of successive Approximations -Euler's and Modified Euler's Method- Problems onsingle step methods–

Runge – Kutta Methods – Predictor – corrector method-Milne's method.

UNIT-V **9 Hours**

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

Text Books:

1. Dr. B. S. GREWAL, Higher Engineering Mathematics. Kanna Publications, 42th edition.
2. B.V. Ramana, A Text Book of Engineering Mathematics-I, TATA MCGRAWHILL
3. E. Rukmangadachari and Keshava Reddy, A Text Book of Engineering Mathematics-I.
4. T.K.V. Iyengar, B. Krishna Gandhi and Others, A Text Book of Engineering Mathematics–I, S. Chand and Company.

References:

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

20ACS06	**COMPUTER ORGANIZATION AND ARCHITECTURE**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

Course Outcomes:

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

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

UNIT I **7 hrs**

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

UNIT II **8 hrs**

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

UNIT III **8 hrs**

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

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

UNIT IV **9 hrs**

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

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

UNIT V **8 hrs**

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

Text Books:

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

Reference Books:

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

Mapping :

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)

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

		L	T	P	C
20ACS07	**OBJECT ORIENTED PROGRAMMING THROUGH JAVA**	**3**	**0**	**0**	**3**

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

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

UNIT-I **9 hrs**

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

UNIT –II **8 hrs**

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

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

UNIT-III **6 hrs**

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

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

UNIT-IV **9 hrs**

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

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

UNIT- V **9 hrs**

Enumerations, Wrapper classes, auto boxing, annotations.

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

Text Books:

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

Reference Books:

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

Mapping :

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

20AIT01	AUTOMATA AND COMPILER DESIGN	L	T	P	C
		3	0	0	3

Course Outcomes:

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

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

UNIT-I **7 hrs**

COMPILER, FORMAL LANGUAGE, REGULAR EXPRESSIONS:

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

UNIT-II **8 hrs**

CONTEXT FREE GRAMMARS AND GRAMMAR PARSING:

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

UNIT-III **10 hrs**

SEMANTICS, RUN TIME STORAGE MANAGEMENT:

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

UNIT-IV **8 hrs**

INTERMEDIATE CODE GENERATION

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

UNIT-V **9 hrs**

CODE OPTIMIZATION AND CODE GENERATION:

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

Text Books:

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

Reference Books:

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

20ACS08	**RELATIONAL DATABASE MANAGEMENT SYSTEMS**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

Course Outcomes:

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

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

UNIT –I **8 hrs**

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

UNIT-II **9 hrs**

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

UNIT-III **9 hrs**

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

UNIT-IV **9 hrs**

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

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

UNIT-V **8 hrs**

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

Text Books:

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

Reference Books:

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

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

		L	T	P	C
20ACS09	**OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB**	**0**	**0**	**3**	**1.5**

Course Outcomes:

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

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

Week-1:

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

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

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

Week-2:

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

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

Week-3:

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

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

Week-4:

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

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

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

Week-5:

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

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

Week 6

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

Week 7

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

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

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

Week 8

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

Week 9

In a given string, find the first non-repeating character .You are given a string, that can contain repeating characters. Your task is to return the first character in this string that does not repeat. i.e.,

occurs exactly once. The string will contain characters only from English alphabet set, i.e., ('A' - 'Z') and ('a' - 'z'). If there is no non-repeating character print the first character of string.

Week 10

Practice sessions on HackerRank and HackerEarth

Example: HackerEarth –jumble letter, missing alphabets

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

		L	T	P	C
20AIT02	**AUTOMATA AND COMPILER DESIGN LAB**	**0**	**0**	**3**	**1.5**

Course Outcomes:

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

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

List of Experiments:

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

Text Books:

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

Reference Books:

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

20ACS10	**RELATIONAL DATABASE MANAGEMENT SYSTEMS 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. Design and implement a database schema for given problem.
2. Implement SQL queries using query language tools.
3. Apply the normalization techniques for development of application software to realistic problems.
4. Formulate queries using SQL tools for DML/DDL/DCL commands.

LIST OF EXPERIMENTS

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

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

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

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

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

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

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

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

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

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

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

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

II B.Tech I Semester CSO (Common to CSE)

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

		L	T	P	C
20ACS11	**ANDROID APPLICATION DEVELOPMENT**	**1**	**0**	**2**	**2**

Course Outcomes:

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

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

LIST OF EXPERIMENTS

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

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

Text Books:

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

Reference Books:

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

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**2**	**3**	**1**	**3**								**3**	**3**
CO2	**3**	**1**	**3**		**3**								**3**	
CO3	**3**		**3**		**3**									**2**
CO4	**3**	**2**			**3**								**3**	**3**
Average	**3**	**1.66**	**3**	**1**	**3**								**3**	**2.66**
Level of Correlation	**3**	**2**	**3**	**1**	**3**								**3**	**3**

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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

20AMB02	UNIVERSAL HUMAN VALUES-I	L	T	P	C
		2	0	0	0

(Mandatory course)

Course Outcomes:

After completion of the course students will be able to

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

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

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

UNIT – II: Understanding Harmony in the Human Being - Harmony in Myself

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

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

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

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

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

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

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

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

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

Textbooks:

1. R R Gaur, R Asthana, G P Bagaria, "A Foundation Course in Human Values and Professional Ethics", 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1.
2. R R Gaur, R Asthana, G P Bagaria, "Teachers' Manual for A Foundation Course in Human

Values andProfessional Ethics", 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2.

Reference Books:

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

Mapping :

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
II B.Tech - I Semester CSO (Common to All Branches)

		L	T	P	C
20AHS11	**QUANTITATIVE APTITUDE AND REASONING-I**	**2**	**0**	**0**	**0**

Course Outcomes:

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

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

UNIT- I **9 Hours**

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

UNIT-II **9 Hours**

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

UNIT-III **9 Hours**

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

UNIT-IV **9 Hours**

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

UNIT-V **9 Hours**

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

Text Books:

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

Mapping :

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

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

SRI VENKATESWARA COLLEGE OFENGINEERING & TECHNOLOGY (AUTONOMOUS)

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

		L	T	P	C
20AHS13	**PROBABILITY AND STATISTICS**	**3**	**1**	**0**	**3**

Course Outcomes:

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

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

UNIT-I 11 Hours

RANDOM VARIABLES & THEORITICAL DISTRIBUTIONS: Introduction on Probability - Discrete and Continuous random variables – Distribution functions – Moment generating functions. Binomial distribution – Poisson distribution – Normal distribution – related properties.

UNIT-II 9 Hours

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

UNIT-III 8 Hours

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

UNIT-IV 9 Hours

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

ANALYSIS OF VARIANCE – One way and Two way Classifications

UNIT-V **8 Hours**

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

Text Books:

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

References Books:

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

II B.Tech, II Semester CSO (Common to CSE, CSD, CSM &IT)

20AHS14	**DISCRETE STRUCTURES & GRAPH THEORY**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

Course Outcomes:

After Completion of the course the student will be able to

1. Apply the rules of inference to determine the validity of argument.
2. Apply lattice theory and Boolean algebra in theory and design of computers.
3. Apply generating functions to solve the combinatorial problems which makes easier to solve broad spectrum of problems.
4. Apply the graph theory and trees in describing structures involving hierarchy. Also used in switching and logical design.

UNIT-I: **9 Hours**

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

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

UNIT-II: **9 Hours**

SET THEORY AND BOOLEAN ALGEBRA: Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse diagram. Functions: Inverse Function Compositions of functions, Lattice and its Properties. Introduction to Boolean Algebra- Sub Algebra, Direct product and homomorphism.

UNIT-III: **9 Hours**

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

UNIT- IV: **9 Hours**

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

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

UNIT-V: **9 Hours**

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

Text Books:

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

Reference Books:

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

II B.Tech II Semester (Common to CSE(DS),CSECSE(IoT), IT,
III B.Tech I Semester CSE (AI & ML)-PE-I

20ACS12: DESIGN AND ANALYSIS OF ALGORITHMS

L	T	P	C
3	0	0	3

Course Outcomes

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

UNIT-I **8 hrs**

Basics of Algorithms and Mathematics:

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

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

UNIT-II ` **9 hrs**

Divide and Conquer Algorithm:

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

UNIT-III **8 hrs**

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

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

UNIT-IV **7 hrs**

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

UNIT-V

Backtracking **8 hrs**

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

Introduction to NP, Completeness:

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

Text Books:

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

Reference Books:

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

Mapping :

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

20ACS13 OPERATING SYSTEMS

L	T	P	C
3	0	0	3

Course Outcomes:

After Completion of the course the student will be able to

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

UNIT I

INTRODUCTION TO OS **8 hrs**

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

UNIT II

SCHEDULING **8 hrs**

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

UNIT III

PROCESS SYNCHRONIZATION & DEADLOCK **8 hrs**

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

UNIT IV 7 hrs

MEMORY MANAGEMENT STRATEGIES

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

UNIT V 8 hrs

FILE SYSTEM INTERFACE

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

Text Books:

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

Reference Books:

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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

		L	T	P	C
20AIT04	**SOFTWARE ENGINEERING**	**3**	**0**	**0**	**3**

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 **9 Hours**

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 **7 Hours**

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 **12 Hours**

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 **9 Hours**

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 **9 Hours**

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

Text Books:

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

Reference Books:

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

Online Learning Resources:

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

20ACS14 DESIGN & ANALYSIS OF ALGORITHMS LAB

L	T	P	C
0	0	3	1.5

Course Outcomes:

After Completion of the course the student will be able to

1. Design algorithms using appropriate design techniques (brute-force, greedy, dynamic programming, etc.)
2. Apply a variety of algorithms such as sorting, graph related, combinatorial using high level language tools.
3. Analyze and compare the performance of algorithms using language features.
4. Apply and implement learned algorithm design techniques and data structures to solve real-world problems.

LIST OF EXPERIMENTS

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

Mapping :

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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

20ACS15 **OPERATING SYSTEMS LAB**

L	T	P	C
0	0	3	1.5

Course Outcome:

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

1. Execute the basic command in UNIX operating system and shell program.
2. Design the principles of CPU scheduling concepts.
3. Design and symbolize the principles of synchronization and contiguous memory allocation technique.
4. Simulate the principle of page replacement algorithm
5. Simulate the concepts of disk scheduling algorithm

LIST OF EXPERIMENTS

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

Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	1	3								3	3
CO2	3	3	3	2									3	2
CO3	3	2	3	2									3	2
CO4	3	2	3	2									3	1
CO5	3	2	3	2									3	2
Average	3	2.2	2.6	2.25	3								3	2
Level of Correlation	3	2	3	2	3								3	2

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

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

		L	T	P	C
20AIT05	**SOFTWARE ENGINEERING LAB**	**0**	**0**	**3**	**1.5**

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

1. Acquaint with historical and modern software methodologies.
2. Understand the phases of software projects and practice the activities of each phase
3. Practice clean coding
4. Take part in project management
5. Adopt tools for distributed computation.

List of Experiments:

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

References :

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

Online Learning Resources/Virtual Labs:

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

Mapping :

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

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

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

		L	T	P	C
20ACO01	**UI Design with Flutter**	**1**	**0**	**2**	**2**

Course outcomes:

At the end of the course the student will be able to learn and explore the:

1. Fundamentals of UI
2. Exploring Widgets
3. Stateless vs Stateful Widgets
4. Playing with Rows & Columns
5. Scrollable UI
6. Material Widgets
7. Widgets for Inputs

List of Experiments

1. Layouts:

Stateless vs Stateful, Column, Row, Column & Row Together, Stack, ListView, GridView, SingleChildScrollView.

2. Material Widgets:

Buttons, AppBar, Drawer, Tabbar, Bottom Navigation, Popup Menu

3. Inputs:

TextField, Switch, Checkbox, Radio Button, Slider, Dropdown Button

4. Project : Grocery App:

Project Introduction, Setting up environment, Adding Required, Assets, Welcome Screen Design, Welcome Screen Code Optimise, Login Page Design, Register Page Design, Working with TabsPage, Account Screen Design, Edit Profile, Address Screen Design, Manage Address Screen, Orders Screen, Order Detail Screen, Cart Page Design, Home Screen Design, Optimising Home Screen.

TEXT BOOK:

1. Beginning App Development with Flutter by Rap Payne.

REFERENCE BOOKS:

1. Beginning Flutter: A Hands On Guide to App Development by Marco L. Napoli.
2. Flutter Apps Development: Build Cross-Platform Flutter Apps with Trust by Mouaz M. Al-Shahmeh.
3. Flutter Complete Reference 2.0 by Alberto Miola.
4. Flutter: Développez vos applications mobiles multiplateformes avec Dart by

Julien Trillard.

5. Flutter for Beginners by Thomas Bailey and Alessandro Biessek.

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

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

		L	T	P	C
20AHS15	**QUANTITATIVE APTITUDE AND REASONING-II**	**2**	**0**	**0**	**0**

Course Outcomes:

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

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

UNIT-I **9 Hours**

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

UNIT-II **9 Hours**

QUANTITATIVE ABILITY IV: Time Speed and Distance – Uniform and Variable speed – Conversion - Average Speed –Relative Speed – Effective speed - Problems on Trains – Stationary point and object – Moving Point and Object – Boats and Streams – Downstream and Upstream - Races and Games – Head start – Dead Heat – Escalator – Number of steps

UNIT-III **9 Hours**

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

UNIT-IV **9 Hours**

VERBAL II: Tense – Present Tense, Past Tense, Future Tense - Voice – Active voice, Passive voice and Active to Passive Voice Conversion Rules – Speech – Direct Speech, Indirect Speech and Direct to Indirect Speech Conversion Rules –Essay Writing – Types, Steps, Format.

UNIT V **9 Hours**

SOFT SKILL II: Time Management - Stress Management - Team Work - Accent and Voice Communication - Interview Skills.

Text Books:

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

Mapping :

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

II B.Tech II Semester CE,ME & ECE

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

		L	T	P	C
20AMB03	**MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS**	**3**	**0**	**0**	**3**

Course Outcomes:

After the completion of the course student will be able to

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

UNIT –I INTRODUCTION TO MANAGERIAL ECONOMICS

Managerial Economics: Definition, Nature and Scope –Demand analysis: Law of demand, Demand determinants, Elasticity of Demand: Definition, Types,Measurement and Significance –Demand forecasting methods (Survey methods, Statistical methods, Expert opinion method, Test marketing, Controlled experiments, Judgmental approach)

UNIT –II THEORY OF PRODUCTION AND COST ANALYSIS

Production function –Cobb Douglas Production function –Laws of Returns–Internal and External economies of scale COST ANALYSIS: Cost concepts, Fixed vs. Variable costs, Explicit vs. Implicit Costs, Out of Pocket costs Vs Imputed costs, Opportunity Cost and Sunk costs BREAK EVEN ANALYSIS: Concept of Break Even Point (BEP)– Break Even Chart – Assumptions underlying and Practical significance of BEP (Simple Problems).

UNIT –III INTRODUCTION TO MARKETS AND BUSINESSORGANIZATIONS:

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

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

UNIT –IV CAPITAL AND CAPITAL BUDGETING:

Capital and its Significance –Types of capital –Estimation of fixed and working capital requirements –Methods and sources of raising capital –Capital Budgeting Methods: Payback Method, Accounting Rate of Return (ARR), and Net Present Value (NPV) Method (Simple Problems).

UNIT –V FINANCIAL ACCOUNTING AND FINANCIAL ANALYSISTHROUGH RATIOS:

Double entry book keeping –Journal –Ledger –Trial Balance –Trading Account and balance sheet with simple adjustments Ratio analysis: Computation of Liquidity Ratios (Current and Quick Ratio), Activity Ratios (Inventory Turnover Ratio and Debtor Turnover Ratio), CapitalStructure Ratios (Debt-Equity Ratio and Interest Coverage Ratio) and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratio and EPS).

Text Books:

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

Reference Books:

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

Mapping :

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

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

20ACS16	WEB TECHNOLOGIES	L	T	P	C
		3	0	0	3

Course Outcomes:

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

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

UNIT- I **9 Hrs**

Introduction to HTML: HTML, HTML Syntax, Semantic Markup, Structure of HTML Documents, HTML Elements, HTML5 Semantic Structure Elements. HTML Tables and Forms, Introducing Tables, Styling Tables, Introducing Forms, Form Control Elements, Table and Form Accessibility, Micro formats.

UNIT-II **9 Hrs**

Introduction to CSS: CSS Syntax, Location of Styles, Selectors, The Cascade: How Styles Interact, The Box Model, CSS Text Styling.

Advanced CSS: Layout, Normal Flow, Positioning Elements, Floating Elements, Constructing Multicolumn Layouts, Approaches to CSS Layout, Responsive Design, CSS Frameworks.

UNIT-III **9 Hrs**

JavaScript: Fundamentals, Ways to JavaScript can be linked to an HTML page, Variables and data types, Conditional, Loops, Arrays, Objects, Functions, Object Prototypes, The Document Object Model (DOM), Modifying the DOM, Events, Event Types, Forms.

JavaScript frameworks: Node.js, MongoDB, AngularJS.

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

UNIT-IV 9 hrs

PHP: PHP Tags, Comments, Variables, Data Types, and Constants, Writing to Output, printf, Program Control, Functions, Arrays and Superglobals, Arrays, $GET and $POST Superglobal Arrays, $SERVER Array, $Files Array, Reading/Writing Files.

PHP Classes and Objects: Object-Oriented Overview, Classes and Objects in PHP, Object Oriented Design, Error Handling and Validation, Errors and Exceptions, PHP Error Reporting, PHP Error and Exception Handling.

Working with Databases: SQL, NoSQL, Database APIs, Managing a MySQL Database, Accessing MySQL in PHP.

UNIT-V 9 Hrs

Managing State: The Problem of State in Web Applications, Passing Information via Query Strings, Passing Information via the URL Path, Cookies, Serialization, Session State, HTML5 Web Storage, Caching.

XML Processing and Web Services: XML Processing, JSON, Overview of Web Services. Content Management Systems, Search Engines, Social Networks and Analytics.

TEXT BOOK:

1. Randy Connolly, Ricardo Hoar, "Fundamentals of Web Development", 2nd Edition, Pearson Education India, 2018.

REFERENCE BOOKS:

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

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

Mapping :

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester CSO
(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)

20ACS17 **COMPUTER NETWORKS**

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT- I 13 hrs

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

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

UNIT-II 10 hrs

The Medium Access Control Sublayer: Channel allocation Problem, Multiple Access Protocols, Ethernet: Classic Ethernet physical layer, Ethernet MAC Sublayer Protocol, Ethernet Performance, Switched Ethernet, Fast Ethernet, Gigabit Ethernet,10-Gigabit Ethernet, Wireless LANs: The 802.11 Protocol Stack, 802.11 Physical Layer,802.11 MAC Sublayer Protocol, 802.11 Frame Structure,

UNIT-III **10**hrs

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

UNIT-IV **8 hrs**

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

UNIT-V **5 hrs**

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

TEXT BOOK:

1. Computer Networks, Fifth Edition, Andrew S. Tanenbaum, David J Wetherall Pearson Education, 2011.

REFERENCE BOOKS:

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

Mapping :

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester CSO

		L	T	P	C
20ACO02	**SENSORS AND ACTUATORS (Professional Elective -I)**	**3**	**0**	**0**	**3**

Course Outcome:

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

1. Classify different Sensors & Actuators based on various physical phenomena and differentiate their performance characteristics
2. Analyze the working principles of thermal, optical & electric sensors and actuators to interpret their mathematical model
3. Interpret the functional principles of magnetic, thermal & Chemical sensors and actuators to interpret their mathematical model
4. Select the relevant sensors and actuators to design real-time data acquisition from ambience via case studies.

UNIT – I Overview of Sensors and Actuators 10 Hrs

The five senses: vision, hearing, smell, taste, and touch – Definitions: Sensors & Actuators – Overview of Sensor and Actuator classifications – Performance characteristics of Sensors & Actuators: Transfer Function, Range, Span, Input and Output Full Scale, Resolution, and Dynamic Range - Calibration & Reliability

Temperature Sensors and Thermal Actuators: Thermoresistive sensors: Thermistors, Resistance temperature, and silicon resistive sensors – Thermoelectric sensors – Other Temperature sensors: Optical and Acoustical – Thermomechanical Sensors and Actuators – Case study: Breath analyzer using temperature.

UNIT – II Optical Sensors and Actuators 10 Hrs

Principles of Optics: Optical units – Quantum effects – Quantum-based Optical sensors – Photoelectric sensors – Charge coupled device (CCD) based – Thermal-based Optical sensors – Active infrared (AFIR) sensors – Optical Actuators – Case study: Liquid Level Indicator using Optical Sensors

Electric and Magnetic Sensors and Actuators: Principles of Electric and Magnetic fields: Basic units – The Electric field: Capacitive Sensors & Actuators – Magnetic sensors and actuators – Magnetoresistance – Magnetostrictive Sensors and Actuators – Magnetometers – Magnetic actuators: Voice Coil Actuators, Motors as Actuators & Magnetic Solenoid Actuators and Magnetic Valves – Case Study: Speed sensing and odometer in a car using smart sensors.

UNIT – III Mechanical Sensors and Actuators 9 Hrs

Definitions and units – Force Sensors: Strain Gauges, Semiconductor Strain Gauges & Tactile Sensors – Accelerometers: Capacitive Accelerometers, Strain Gauge Accelerometers & Magnetic Accelerometers – Pressure Sensors: Mechanical, Piezo resistive, Capacitive & Magnetic – Velocity sensing – Inertial sensors and actuators: Mechanical or Rotor & Optical Gyroscopes – Case study: Tire-pressure monitoring system using smart sensors.

UNIT – IV Acoustic Sensors and Actuators 9 Hrs

Definitions and units – Elastic waves and their properties – Microphones: Carbon, Magnetic, Ribbon and Capacitive Microphones – Piezoelectric effect – Piezoelectric Sensors – Acoustic Actuators: Loudspeakers, Headphones and Buzzers - Magnetic and Piezoelectric – Ultrasonic sensors and actuators – Case Study: Ultrasonic parking system.

UNIT – V Chemical Sensors and Actuators 9 Hrs

Chemical units and Definitions – Electrochemical sensors: Metal Oxide Sensors and Solid Electrolyte Sensors – Potentiometric smart sensors: Glass Membranes, Soluble Inorganic Salt Membrane and Polymer - Immobilized Ionophore Membranes sensors – Thermochemical, Optical, Mass humidity gas sensors – Chemical Actuators: The Catalytic Converter - The Airbag System using smart sensors – Case study: Water quality monitoring system - Contemporary Issues.

TEXT BOOKS:

1. Nathan Ida, "Sensors, Actuators and their Interfaces - A Multidisciplinary Introduction", 2020, 2nd Edition, IET, United Kingdom.

REFERENCE BOOKS:

1. Jacob Fraden, "Handbook of Modern Sensors Physics, Designs, and Applications", 2016, 5th Edition, Springer, Switzerland.
2. Subhas Chandra Mukhopadhyay, Octavian Adrian Postolache, Krishanthi P. Jayasundera, Akshya K. Swain, "Sensors for Everyday Life Environmental and Food Engineering", 2017, Volume 23, Springer, Switzerland.

MAPPING

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

III B.Tech I Semester CSO
(Common to CSE,IT,CSO,CSD)

20AIT13	SOFTWARE PROJECT MANAGEMENT	L	T	P	C
		3	0	0	3

COURSE OUTCOMES:

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

1.Implement a project to manage project schedule, expenses and resources of application.
2.Obtain adequate knowledge about software process models and software effort estimation techniques.
3.Design and develop project plans to address real-world management challenges.
4.Aware of project management theories, tools, techniques and methods to manage the software projects at each stage of software development life cycle.
5.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 9 Hrs

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 12Hrs

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 SOFTWARE ARCHITECTURES 10 Hrs

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

UNIT IV ITERATIVE PROCESS PLANNING- PROJECT ORGANIZATIONS ANDRESPONSIBILITIES 12 Hrs

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 9Hrs

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.

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	3	3	3	-	-	-	-	-	-	-	-	2	2
CO2	3	3	-	-	-	-	-	-	-	-	-	-	2	3
CO3	3	3	3	-	-	-	-	-	-	-	-	-	2	3
CO4	3	3	3	3	2	-	-	-	-	-	-	-	3	2
CO5	2	2	-	-	-	-	-	-	-	-	-	-	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester CSO

20ACO03 DATA SCIENCE FOR ENGINEERS

L	T	P	C
3	0	0	3

(Professional Elective -I)

Course Outcomes:
1. Describe a flow process for data science problems (Remembering)
2. Classify data science problems into standard typology (Comprehension)
3. Develop R codes for data science solutions (Application)
4. Correlate results to the solution approach followed (Analysis)
5. Assess the solution approach (Evaluation)

Unit I: **9 hours**

Introduction to DS,ML and AI:- Definitions of DS and MI,What is learntt in ML algorithms?How does learning happen in ML? Decision making in ML.Discussion on AI.Why are ML & AI Techiniques effective? **DS & ML Fundamental Concepts:-**Classification and Function Approximation,Model Forms ,Training Philosophy.Generality of Data Science/Machine learning Solutions'

Examples of Function approximation:
i)Predicting materials property for different chemicals.
ii)Predicting scores in a game of cricket
Examples of Classification Problem:
i)Fraud detection in credit card transaction
ii) Distinguishing objects – in a self driven cars.
Data classification & Data Imputation

Unit II: **9 hours**

Linear algebra for DS & ML:-Matrices as a concept for data Organization,Matrix view of Linear Algebra,Fundamental Subspaces,Dat science and fundamental,Solving Linear equations – Multiple views,orthogonalityProjections and Hyper plans.Eigen valves,Eigen vectors and SVD.

Unit III: **9 hours**

Optimization for DS and ML:- Elements of optimization formulation Discussion on objective functions for classification.First and second order analytical conditions for optimalityof unconstrained NLPs,Numerical approaches to solve optimization problem,Alternate learning algorithm.,Impact of non convexityon ML Algorithms. Handling constraints,Dynamic Programming

Unit IV: **9 hours**

Statistical foundations for DS and ML:-Decomposition of Data Matrix into Model and uncertainty matrices,Uncertainty Characterization,Random variables and probobality Mass functions,Deriving Model Probablity Distribution function.Prperties of proboblity distribution function,Qualitative validation of random variables.Estimating parameters of distribution.

Unit V:- **9 hours**

Sampling Distributions:- Important Sampling Distributions,Determining quality of Estimates,Hypothesis testing.Distributions of multiple related random Variables.Function approximation methods (PCA & K-NN)

Text Book:-

1. Data Science for Engineers:-Rengaswamy, **Raghunathan**, Suresh,

Reference Books:-

1. INTRODUCTION TO LINEAR ALGEBRA - BY GILBERT STRANG
2. APPLIED STATISTICS AND PROBABILITY FOR ENGINEERS – BY DOUGLAS MONTGOMERY

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2											3	1
CO2	3	3	2	2	2								3	
CO3	3												3	2
CO4	3	3											3	1
Average	3	2.66	2	2	2								3	1.33
Level of Correlation	3	3	2	2	2								3	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester CSO (Common to CSE,IT)-PE-I
III B.Tech I Semester ME(Open Elective-I)
III B.Tech II Semester CE(Open Elective-II)

		L	T	P	C
20ACS21	**COMPUTER GRAPHICS**	**3**	**0**	**0**	**3**

(Professional Elective -I)

COURSE OUTCOMES:

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

UNIT-I **8 Hrs**

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

UNIT-II **10 Hrs**

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

UNIT-III **10 Hrs**

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

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

UNIT-IV **10 Hrs**

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

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

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

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

UNIT-V **8Hrs**

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
III B.Tech I Semester CSO

20ACO04	**IOT AUTOMATION (Professional Elective -I)**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

Course Outcomes:

1. Discover key IIoT concepts including identification, sensors, localization, wireless protocols, data storage and security
2. Explore IoT technologies, architectures, standards, and regulation
3. Realize the value created by collecting, communicating, coordinating, and leveraging the data from connected devices
4. Examine technological developments that will likely shape the industrial landscape in the future
5. Understand how to develop and implement own IoT technologies, solutions, and applications

UNIT - I: Introduction & Architecture: 10 Hrs

What is IIoT and the connected world? the difference between IoT and IIoT, Architecture of IIoT, IOT node, Challenges of IIOT. Fundamentals of Control System, introductions, components, closed loop & open loop system.

UNIT - II: IIOT Components: 12 Hrs

Introduction to Sensors (Description and Working principle): What is sensor? Types of sensors, working principle of basic Sensors -Ultrasonic Sensor, IR sensor, MQ2, Temperature and Humidity Sensors (DHT-11). Digital switch, Electro Mechanical switches.

UNIT - III: Communication Technologies of IIoT: 10 Hrs

Communication Protocols: IEEE 802.15.4, ZigBee, Z Wave,Bluetooth, BLE, NFC, RFID Industry standards communication technology (LoRAWAN, OPC UA,MQTT), connecting into existing Modbus and Profibus technology, wireless network communication.

UNIT – IV: Visualization and Data Types of IIoT: 12 Hrs

Front-end EDGE devices, Enterprise data for IIoT, Emerging descriptive data standards for IIoT, Cloud database, Cloud computing, Fog or Edge computing. Connecting an Arduino/Raspberry pi to the Web: Introduction, setting up the Arduino/Raspberry pi development environment, Options for Internet connectivity with Arduino, Configuring your Arduino/Raspberry pi board for the IoT.

UNIT - V: Retrieving Data: Extraction from Web: 9 Hrs

Grabbing the content from a web page, Sending data on the web, Troubleshooting basic Arduino issues, Types of IoT interaction, Machine to Machine interaction (M2M). Control & Supervisory Level of Automation: Programmable logic controller (PLC), Real-time control system, Supervisory Control & Data Acquisition (SCADA). HMI in an automation process, ERP MES.

TEXT BOOKS:

1. The Internet of Things in the Industrial Sector, Mahmood, Zaigham (Ed.) (Springer Publication)

2. Industrial Internet of Things: Cyber manufacturing System, Sabina Jeschke, Christian Brecher, Houbing Song, Danda B. Rawat (Springer Publication)

3. Industrial IoT Challenges, Design Principles, Applications, and Security by Ismail Butun (editor)

REFERENCE BOOK:

1. Jerker Delsing, IoT Automation: Arrowhead Framework, CRC Press.

Mapping:

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

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

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

		L	T	P	C
20AEC31	**DIGITAL LOGIC DESIGN**	**3**	**0**	**0**	**3**

(Open Elective I)

Course outcomes:

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

1. understand the number system and boolean algebra functions.
2. Implement various logic gates using boolean expressions.
3. Design combinational and sequential circuits for various Digital IC applications.
4. LSI and MSI circuits using programmable logic devices (PLDs)

UNIT- I NUMBER SYSTEM & BOOLEAN ALGEBRA

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

UNIT-II GATE LEVEL MINIMIZATION

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

UNIT- III COMBINATIONAL CIRCUITS

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

UNIT-IV SEQUENTIAL CIRCUITS

Sequential Circuits, Latches, Flips-Flops, Conversion of Flip Flops, Analysis of Clocked sequential circuits, State Reduction & Assignment, Design procedure, Registers & Counters

–Registers, Shift Registers, Ripple Counters, Synchronous counters, Design of modulo-N Counters, Ring and Johnson Counters

UNIT-V MEMORIES

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

mapping:

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech - I – Semester ECE (OE-III)

III B.Tech I Semester CSO (Common to CSE, IT,CSD , CSO,CSM & EEE)

III B.Tech - I – Semester ME (PE-I)

20AME18 ROBOTICS AND ARTIFICIAL INTELLIGENCE

L	T	P	C
3	0	0	3

(Open Elective I)

Course Outcomes:

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

1. Demonstrate the knowledge in an application of AI, and select strategies based on application requirement.
2. Describe the basic concepts of robotics and its importance in the modern world and classification of robots and its end effectors for typical manufacturing industry and service sector.
3. Summarize the perception about robot components, actuators, sensors and machine vision.
4. Analyze the manipulator kinematics, dynamics for typical robots which will be used for complex operations and analyze the path planning for typical robots.
5. Choose a program that the robot can integrate with the manufacturing system to produce quality products with minimum cost with optimum usage of resources.

UNIT: I Introduction of AI **10 hours**

Artificial Intelligence: Introduction to Artificial Intelligence (AI), History. AI techniques, LISP programming, AI and Robotics, LISP in the factory, sensoring and digitizing function in machine vision, image processing and analysis, training and vision system. Intelligent Agents: Agents and Environments, the Concept of Rationality, the Nature of Environments, the Structure of Agents.

UNIT: II Introduction to Robotics **10 hours**

Automation versus Robotic technology, Laws of robot, Progressive advancements in Robots, Robot Anatomy, Classification of robots-coordinate method, control method; Specification of robots. Classification of End effectors – Tools as end effectors, Mechanical-adhesive -vacuum-magnetic-grippers.

UNIT: III Robot Actuators, Sensors and Machine Vision **12 hours**

Robot Actuators and Feedback Components: Actuators - Pneumatic and Hydraulic actuators, electric & stepper motors, comparison. Position sensors, resolvers, encoders, velocity sensors, tactile sensors, Proximity sensors, Slip Sensor, Range Sensor, Force Sensor.

Machine Vision: Camera, Frame Grabber, Sensing and Digitizing Image Data Signal Conversion, Image Storage, Lighting Techniques, Image Processing and Analysis-Data Reduction, Segmentation,

Feature Extraction, Object Recognition, Other Algorithms, Applications, Inspection, Identification, Visual Serving and Navigation.

UNIT:4 Manipulator Kinematics and Trajectory Planning 10 hours

Mathematical representation of Robots - Position and orientation, Homogeneous transformations - D-H notation, Forward and inverse kinematics. Manipulator dynamics, Differential transformation, Jacobeans.

Trajectory planning and avoidance of obstacles, path planning, joint integrated motion – straight line motion, basics of trajectory planning, polynomial trajectory planning.

UNIT:5 Robot Applications and Programming 8 hours

Robot Application in Manufacturing: Material Transfer, Material handling, loading and unloading, Processing, spot and continuous arc welding & spray painting, Assembly and Inspection.

Robot Programming: Types, features of languages and software packages.

Textbook(s)

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

Reference Books

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

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

20ACE35 INTEGRATED WASTE MANAGEMENT FOR SMART CITY

L	T	P	C
3	0	0	3

(Open Elective – I)

Course Outcomes:

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

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

UNIT I INTRODUCTION TO SOLID WASTE MANAGEMENT

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

UNIT II MUNICIPAL SOLID WASTE MANAGEMENT

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

UNIT III DISPOSAL OF MUNICIPAL SOLID WASTE

Landfill, Biochemical Processes and Composting, Energy Recovery from Municipal Solid Waste. Municipal Solid Waste (MSW) Rules 2016.

UNIT IV CONSTRUCTION AND DEMOLITION (C&D) WASTE MANAGEMENT

Overview of C&D Waste – Sources, Effects, and Regulations, Beneficial Reuse of C&D Waste Materials.

UNIT V ELECTRONIC WASTE (E-WASTE) MANAGEMENT

Sources, Effects, Issues and Status in India and globally, controlling measures, E-Waste Management Rules 2016 and Management Challenges.

TEXTBOOKS

1. William A Worrell and P. AarneVeslind, “Solid Waste Engineering”, 2nd Edition Cengage Learning,2012(ISBN-13:978-1-4390-6217-3)

2. George Tchobanoglous, Hilary Theisen and Samuel A Vigil, “Integrated Solid Waste Management”,Tata Mc GrawHill, 1993.

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

REFERENCES

1. “MunicipalSolidWasteManagementRules2016”,CentralPollutionControlBoard,Govt.of India, 2016.

2. “Electronic Waste Management Rules 2016”, Central Pollution Control Board, Govt. ofIndia,2016.

3. “Construction and Demolition Waste Management Rules 2016”, Ministry of EnvironmentandForest and Climate Change, Govt. ofIndia, 2016.

Mapping:

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

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

		L	T	P	C
20ACS23	**SOCIAL NETWORK ANALYSIS**	**3**	**0**	**0**	**3**

(Job Oriented Elective I)

Course Outcomes:

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

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

UNIT I INTRODUCTION **9 hrs**

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

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

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

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

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

UNIT IV PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES

9 hrs

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

UNIT VVISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS 9 hrs

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

TEXT BOOKS:

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

REFERENCES:

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

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

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

Mapping:

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

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

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

20ACS24	**Kivy-INTERACTIVE APPLICATIONS AND GAMES IN PYTHON (Job Oriented Elective-I)**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

Course Outcomes:

After completion of the course the student will be able to

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

UNIT-I GUI BASICS AND GRAPHICS 6 hrs

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

UNIT-II WIDGET EVENTS-BINDING ACTIONS 8 hrs

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

UNIT-III IMPROVING THE USER EXPERIENCE 9 hrs

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

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

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

UNIT-V KIVY PLAYER 9 hrs

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

TEXT BOOKS:

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

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

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

REFERENCE BOOKS:

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

Dave Kuhlman, 2009.

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

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLO (AUTONOMOUS)

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

20ACS25	**WEB TECHNOLOGIES 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. Design web pages using HTML and CSS.
2. Create dynamic webpage by applying server and server side scripting languages
3. Apply database connectivity for storing and retrieving data from database through Web page

LIST OF EXPERIMENTS

Week 1:

1. Write a JavaScript to design a simple calculator to perform the following operations: sum, product, difference and quotient.

Week 2:

2. Write a JavaScript that calculates the squares and cubes of the numbers from 0 to 10 and outputs HTML text that displays the resulting values in an HTML table format.

Week 3:

3. Write a JavaScript code that displays text TEXT-GROWING with increasing font size in the interval of 100ms in RED COLOR, when the font size reaches 50pt it displays TEXTSHRINKING in BLUE color. Then the font size decreases to 5pt.

Week 4:

4. Develop and demonstrate a HTML5 file that includes JavaScript script that uses functions for the following problems:

1. Parameter: A string
2. Output: The position in the string of the left-most vowel
3. Parameter: A number
4. Output: The number with its digits in the reverse order

Week 5:

5. Design an XML document to store information about a student in SVCET College. The information must include USN, Name, and Name of the College, Programme, Year of Joining, and

email id. Make up sample data for 3 students. Create a CSS style sheet and use it to display the document.

Week 6:

6. Write a PHP program to keep track of the number of visitors visiting the web page and to display this count of visitors, with proper headings.

Week 7:

7. Write a PHP program to display a digital clock which displays the current time of the server.

Week 8:

8. Write the PHP programs to do the following:

1. Implement simple calculator operations.
2. Find the transpose of a matrix.
3. Multiplication of two matrices.
4. Addition of two matrices.

Week 9:

9. Write a PHP program named states.py that declares a variable states with value "Mississippi Alabama Texas Massachusetts Kansas". Write a PHP program that does the following:

1. Search for a word in variable states that ends in xas. Store this word in element 0 of a list named statesList.
2. Search for a word in states that begins with k and ends in
3. Perform a case-insensitive comparison. [Note: Passing re.Ias a second parameter to method compile performs a case-insensitive comparison.] Store this word in element1 of statesList.
4. Search for a word in states that begins with M and ends in
5. Store this word in element 2 of the list.
6. Search for a word in states that ends in
7. Store this word in element 3 of the list.

Week 10:

10. Write a PHP program to sort the student records which are stored in the database using selection sort.

Week 11:

11. Case Study Schemas (i.e., the tables and their relationships)

1. Travel Photo Sharing Database
2. Art database schema
3. Book CRM Database

Week 12:

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester CSO (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. Configure Host IP, Subnet Mask and Default Gateway in a System in LAN (TCP/IP Configuration).
10. Design and analyze the performance of a set of local area networks interconnected by switches and hub.
11. Case studies: Implement transmission of ping messages/traceroute over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion.

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

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

20AHS16 ADVANCED ENGLISH COMMUNICATION SKILLS	**L**	**T**	**P**	**C**
	1	**0**	**2**	**2**

Course Outcomes:

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

1. Understand language fluency through conversational practices and demonstrate appropriate body language during communication.
2. Apply synonyms, antonyms, one-word substitutes, prefixes and suffixes to develop vocabulary to comprehend oral and written communication.
3. Analyze reading and writing techniques in preparing letters, resumes and technical reports by examining and applying guessing meaning, scanning, skimming and interfering meaning.
4. Demonstrate ability to function effectively as an individual and as a member in diverse teams examining and applying skills in Oral presentations, Interviews and Group Discussions.

UNIT-I 9 Hours

INTER-PERSONAL COMMUNICATION AND BUILDING VOCABULARY:

Starting a conversation, Responding appropriately and relevantly, Using appropriate Body language, Role play in Different situations, Synonyms and antonyms, One-word substitutes, Prefixes and suffixes, Idioms & Phrases and Collocations.

UNIT-II 9 Hours

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

UNIT-III 9 Hours

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

UNIT-IV 9 Hours

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

UNIT-V 9 Hours

GROUP DISCUSSION AND INTERVIEW SKILLS: Dynamics of Group discussion, Intervention, Summarizing, Modulation of voice, Body Language, Relevance, Fluency and organization of ideas and rubrics

of evaluation, Concept and Process of interviews, Pre-interview planning, opening strategies, Answering Strategies, Interview through Tele-conference & Video-conference and Mock Interviews.

Suggested Software:

- Sky Pronunciation
- Pro-power 2
- Globarena Software

References:

1. Kumar Sanjay, Pushpa Lata. English for Effective Communication,Oxford University Press, 2015.
2. Konar Nira**,** English Language Laboratories – A Comprehensive Manual,PHI Learning Pvt. Ltd., 2011.

Mapping:

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

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

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

20AHS21	INDIAN CONSTITUTION	L	T	P	C
		2	0	0	0

Course Outcomes:

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

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

UNIT-I **5 Hours**

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

UNIT-II **5 Hours**

UNION LEGISLATURE: The Parliament, Parliamentary Structure, Process of Legislation, President of India - Powers and Functions; Prime Minister and Council of Ministers; Constitution Amendment Procedure.

UNIT-III **6 Hours**

FEDERALISM IN INDIA: Centre-State Administrative Relationship; Governors - Powers and Functions; State Legislature - Composition and powers; Chief Ministers - Powers and Functions; The Election Commission - Powers and Functions.

UNIT-IV **6 Hours**

JUDICIARY AND PUBLIC SERVICES: The Union Judiciary - Supreme Court and High Court; Fundamental Rights and Duties All India Services - Central Civil Services -State Services

- Local Services.

UNIT-V **6 Hours**

INTERNATIONAL PARTICIPATION: Foreign Policy of India; International Institutions Influence: UNO, WTO, WHO, SAARC, International Summits: BRICS, NSS, UNEP - India's Role in International Negotiations; Environmentalism in India.

TEXT BOOK:

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

REFERENCE BOOKS:

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

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

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

		L	T	P	C
20AHS17	**QUANTITATIVE APTITUDE AND REASONING-III**	**2**	**0**	**0**	**0**

Course Outcomes:

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

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

UNIT-I **9 Hours**

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

UNIT-II **9 Hours**

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

UNIT-III **9 Hours**

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

UNIT-IV **9 Hours**

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

UNIT-V **9 Hours**

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

Text Books:

1. Quantitative Aptitude, Logic Reasoning & Verbal Reasoning, R S Agarwal, S. Chand Publications.

2. Quantitative Aptitude for Competitive Examinations, R S Agarwal, S. Chand Publications

Mapping:

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

3-High Mapping 2- Medium Mapping 1- LowMapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

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

		L	T	P	C
20AHS18	**FRENCH LANGUAGE**	**2**	**0**	**0**	**0**

Course Outcomes:

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

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

UNIT-I **10 Hours**

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

UNIT-II **8Hours**

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

UNIT-III **9 Hours**

AGENDA & INVITATION: Conversation, Time, Fixing a meeting, Alimentation, Moments of the day (from morning to night), Punctuality, Good moments of the day, Inviting someone, Accepting & Refusing Invitations, Family tree, Describing a house interior.

UNIT-IV **8 Hours**

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

UNIT-V **10 Hours**

ITINERARY, EXCURSION & WEEKEND: Asking for & giving directions, Giving order / advice

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

Text Books:

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

Reference Books:

1. Declic 1; Jacques Balnc, Jean-Michel Cartier, Pierre Lederlion; CLE International.
2. Nouveau Sans Frontieres – Vols. 1, 2 & 3.
3. Cours de langue et de civilisation Francaise – Hachette.

MAPPING:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

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

		L	T	P	C
20AHS19	**GERMAN LANGUAGE**	**2**	**0**	**0**	**0**

Course Outcomes:

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

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

UNIT-I **10 Hours**

GERMAN SOUNDS: Vowels, consonants, diphthongs, umlaut, the nouns, gender distinctions, cases, definite and indefinite articles, conjugation of verbs, verbs with separable and inseparable prefixes, modal verbs, personal pronouns, possessive pronouns, reflexive pronouns, cases nominative, accusative and dative.

UNIT-II **8 Hours**

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

UNIT-III **9 Hours**

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

UNIT-IV **8 Hours**

PURPOSE OF LANGUAGE STUDY: Pictures and perceptions, conflicts and solutions, change and the future, the purpose of the study of the German language, listening, understanding, reacting, speaking, communicating, use of language, pronunciation and intonation, reading, reading and

understanding, writing, text writing, text forming, use of language, language reflection, building up the language, language comparison, culture reflection, other cultures and cultural identity.

UNIT-V **10 Hours**

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

Text Books:

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

Reference Books:

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

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

		L	T	P	C
20AHS20	**JAPANESE LANGUAGE**	**2**	**0**	**0**	**0**

Course Outcomes:

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

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

UNIT-I **8 Hours**

INTRODUCTION TO JAPANESE SYLLABLES AND GREETINGS: Introduction of Japanese language, alphabets; Hiragana, katakana, and Kanji Pronunciation, vowels and consonants. Hiragana – writing and reading; Vocabulary: 50 Nouns and 20pronouns, Greetings.

UNIT-II **10 Hours**

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

UNIT-III **8 Hours**

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

UNIT-IV **10 Hours**

FORMING QUESTIONS AND GIVING ANSWERS: Classification of Question words (Dare, Nani, Itsu, Doyatte, dooshite, Ikutsu, Ikura); Classification of Te forms, Polite form of verbs.

UNIT-V **9 Hours**

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

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

III B.Tech II Semester CSO
IV B Tech I Sem Professional Elective-V CSE(DS),CSE(AI& ML)

		L	T	P	C
20ACO07	**IOT COMMUNICATION PROTOCOL**	**3**	**0**	**0**	**3**

Course Outcomes:
1. Understand fundamentals of IoT architecture outline and standards.
2. Understand and analyze different architectural views.
3. Understand the importance of IoT Data Link Layer & Network Layer Protocols.
4. Understand the importance of Iot Transport & Session Layer Protocols.

UNIT – I **9Hrs**

Introduction: IoT architecture outline, standards - IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service (XaaS), M2M and IoT Analytics.

Unit – II **9Hrs**

Iot Reference Architecture: Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant Architectural views. Real-World Design Constraints- Introduction, Technical Design constraints.

UNIT – III **5Hrs**

IoT Data Link Layer: PHY/MAC Layer (3GPP MTC, IEEE 802.11, IEEE 802.15), Wireless HART, ZWave, Bluetooth Low Energy, Zigbee Smart Energy, DASH7

UNIT – IV **6Hrs**

Network Layer Protocols: Network Layer-IPv4,IPv6, 6LoWPAN, 6TiSCH,ND, DHCP, ICMP, RPL, CORPL, CARP.

UNIT – V **7Hrs**

IOT Transport & Session Layer Protocols: Transport Layer (TCP, MPTCP, UDP, DCCP, SCTP)-(TLS, DTLS) – Session Layer-HTTP, CoAP, XMPP, AMQP, MQTT.

TEXT BOOKS:

1. Daniel Minoli, “Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications”, ISBN: 978-1-118-47347-4, Willy Publications ,2016

2. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David

Boyle, “From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”,1st Edition, Academic Press, 2015.

REFERENCE BOOKS:

1. Bernd Scholz-Reiter, Florian Michahelles, “Architecting the Internet of Things”, ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer, 2016.

2. N. Ida, Sensors, Actuators and Their Interfaces, Scitech Publishers, 2014.

MAPPING

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

III B.Tech II Semester CSO
III B.Tech II Semester (Professional Elective-II CSE(DS))

		L	T	P	C
20ACO08	**COMPUTER VISION AND ROBOTICS**	**3**	**0**	**0**	**3**

Pre-Requisites: UG level Course in Linear Algebra and Probability.

Course Outcome:

1. Implement fundamental image processing techniques required for computer vision.
2. Implement boundary tracking techniques.
3. Apply chain codes and other region descriptors, Hough Transform for line, circle, and ellipse detections.
4. Apply 3D vision techniques and Implement motion related techniques.
5. Develop applications using computer vision techniques.

UNIT – I **9Hrs**

CAMERAS: Pinhole Cameras. Radiometry – Measuring Light: Light in Space, Light Surfaces, Important Special Cases. Sources, Shadows, And Shading: Qualitative Radiometry, Sources and Their Effects, Local Shading Models, Application: Photometric Stereo, Interreflections: Global Shading Models. Color: The Physics of Color, Human Color Perception, Representing Color, A Model for Image Color, Surface Color from Image Color.

UNIT – II **9Hrs**

Linear Filters: Linear Filters and Convolution, Shift Invariant Linear Systems, Spatial Frequency and Fourier Transforms, Sampling and Aliasing, Filters as Templates. Edge Detection: Noise, Estimating Derivatives, Detecting Edges. Texture: Representing Texture, Analysis (and Synthesis) Using Oriented Pyramids, Application: Synthesis by Sampling Local Models, Shape from Texture.

UNIT – III **9Hrs**

The Geometry of Multiple Views: Two Views. Stereopsis: Reconstruction, Human Stereposis, Binocular Fusion, Using More Cameras. Segmentation by Clustering: What Is Segmentation? Human Vision: Grouping and Getstalt, Applications: Shot Boundary Detection and Background Subtraction, Image Segmentation by Clustering Pixels, Segmentation by Graph-Theoretic Clustering.

UNIT – IV **9Hrs**

Segmentation by Fitting a Model: The Hough Transform, Fitting Lines, Fitting Curves, Fitting as a Probabilistic Inference Problem, Robustness. Segmentation and Fitting Using Probabilistic Methods: Missing Data Problems, Fitting, and Segmentation, The EM Algorithm in Practice. Tracking With Linear Dynamic Models: Tracking as an Abstract Inference Problem, Linear Dynamic Models, Kalman Filtering, Data Association, Applications and Examples.

UNIT – V **9Hrs**

Geometric Camera Models: Elements of Analytical Euclidean Geometry, Camera Parameters and the Perspective Projection, Affine Cameras and Affine Projection Equations. Geometric Camera Calibration: Least-Squares Parameter Estimation, A Linear Approach to Camera Calibration, Taking Radial Distortion into Account, Analytical Photogrammetry, An Application: Mobile Robot Localization. Model-Based Vision: Initial Assumptions, Obtaining Hypotheses by Pose Consistency, Obtaining Hypotheses by pose Clustering, Obtaining Hypotheses Using Invariants, Verification, Application: Registration In Medical Imaging Systems, Curved Surfaces and Alignment.

TEXT BOOKS:

1. David A. Forsyth and Jean Ponce: Computer Vision – A Modern Approach, PHI Learning (Indian Edition), 2009.

REFERENCE BOOKS:

1. E. R. Davies: Computer and Machine Vision – Theory, Algorithms and Practicalities, Elsevier (Academic Press), 4th edition, 2013.
2. R. C. Gonzalez and R. E. Woods "Digital Image Processing" Addison Wesley 2008.
3. Richard Szeliski "Computer Vision: Algorithms and Applications" Springer-Verlag London Limited 2011.

Mapping:

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

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

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

20ACO09	**Programming for IoT Boards**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

Course Outcome:

At the end of this course, student will be able to:
1. Investigate various challenges and explore open source hardware prototyping platforms for designing IoT devices
2. Understand basic circuits, sensors and interfacing, data conversion process and shield libraries to interface with the real world
3. Program SBC by exploring protocols, data conversion process, API and expansion boards for practical IoT devices using Python
4. Learn embedded programming constructs and constraints in real time systems for real world socio-economic problems

Unit 1: IoT Ecosystem **9 hours**

Challenges and Levels of implementation - Enabling Technologies - Overview of Processing Elements and Peripherals, Programming for Prototyping Boards, Environment: Board, IDE, shields – Programming: syntax, variables, types, operators, constructs and functions – Sketch: skeleton, compile and upload, accessing pins – debugging: UART communication protocol and serial library

Unit 2: Interfacing for Prototyping Boards **9 hours**

Circuits: design, wiring, passive components - sensors and actuators: interfacing, read and write - software libraries – shields - interfacing and libraries - Programming for Single Board Computers - Board schematic – setup - configure and use - OS implications: linux - basics, file system and processes - shell CLI – GUI - Programming API's - RPi.GPIO - PWM library to access pins -Tkinter.

Unit 3: Interfacing with Single Board Computers **9 hours**

Networking - Internet Connectivity - Standard Internet Protocols – MQTT – CoAP - Networking Socket Interface - Cloud - Public APIs and SDK's for accessing cloud services - Social Network APIs - Interfacing - sensors and actuators - Pi Camera - Servo - APIs for data conversion.

Unit 4: Embedded Programming and RTOS **9 hours**

MCU – GPIO – WDT - timers/counters - I/O - A/D - D/A – PWM – Interrupts – Memory - serial communication UART - I2C – SPI - Peripheral Interfacing OS – basics – types – tasks – process - threads (POSIX Threads) - thread preemption - Preemptive Task Scheduling Policies - Priority Inversion - Task communication - Task Synchronization issues - racing and deadlock - binary and counting semaphores (Mutex example) - choosing RTOS

Unit 5: Real World Projects **9 hours**

IoT Integrated Primary Health Care - Face Detection by AI - Cloud IoT Systems for Smart Agriculture - Smart Home Gadgets - Autonomous Car Features – speed and horn intensity control - Contemporary Issues 2 hours

Text Book(s)

1.Yamanoor, Sai, and Srihari Yamanoor. Python Programming with Raspberry Pi, 2017, 1st edition, Packt Publishing Ltd,. UK

Reference Books

1.Donald Norris, The Internet of Things: Do-It-Yourself Projects with Arduino, Raspberry Pi, and BeagleBone Black, 2015, 1st edition, McGraw Hill Education, India

2.Marco Schwartz, Home Automation with Arduino, 3rd edition, Open Home Automation 2014. Schwartz, Marco. Internet of things with arduino cookbook, 2016, 1st edition, Packt Publishing Ltd., UK

3.Kooijman, Matthijs. Building Wireless Sensor Networks Using Arduino, 2015, 1st edition, Packt Publishing Ltd., UK

Mapping:

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

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

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

20ACO10	**ARCHITECTING SMART IOT DEVICES**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

(Professional Elective -II)

Course Outcome:

1. Understand how the IoT is different from traditional systems.
2. Demonstrate the revolution of internet in mobile and cloud.
3. Examine the architecture and operation of IoT.
4. Explore various tools and programming paradigms for IoT applications.
5. Develop an IoT prototype for real time scenario.

UNIT – I **7 Hrs**

Design Principles of IoT: Design principles of connected devices, data acquiring organizing and analytics in IoT, system architecture of loT.

UNIT – II **9 Hrs**

Prototyping the Embedded Devices for IoT: System hardware and prototyping, sensors and actuators for IoT, Radio module and wireless sensor network, gateways internet and web, software components.

UNIT – III **10 Hrs**

Embedded Programming for IoT: Programming connected devices, C and python for IoT, Case study: Temperature controller, Smart irrigation system.

UNIT – IV **10 Hrs**

Embedded RTOS: Program structure and real time, multitasking and scheduling, RTOS services, signals, semaphores, Nucleus SE, application timers, interrupts in nucleus ES, Nucleus SE initialization and starn1p.

UNIT – V **13 Hrs**

Tools for IoT: Introduction, chef puppet, NETCONF - YANG case studies.

loT physical Devices: Basic building blocks of an IoT device and endpoints, family of ploT devices, pcDuino, Beagle bone black, cubie board, domain specific IoTs.

TEXT BOOKS:

1. Raj Kamal, Internet of Things, Architecture and Design Principles, lst edition, McGraw Hill Education, May 2017.

2. Arsheep Baga and Vijay Madisetti, Internet of Things: A Hands-On Approach, 1st Edition, Universities press, 2015.

REFERENCE BOOKS:

1. David Etter, IoT (Internet of Things Programming: A simple and fast way of Learning IoT, Kindle
edition 2016.

2. Fei HU, Security and Privacy in Internet of Things (loTs): Models, Algorithms, and

Implementations, 1st Edition, CRC Press, 2016.
3. Colin Walls, Embedded RTOS Design Insights and Implementation. 1st edition. Elsevier. December 2020.

MAPPING

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

III B.TECH II SEMESTER CSO

20ACO11	**SOFTWARE TESTING METHODOLOGIES**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

COURSE OUTCOMES:

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

1. Design and develop the best test strategies in accordance to the development model.
2. Implement a project to manage project schedule, expenses and resources of application.
3. Obtain adequate knowledge about software process models and software effort estimation techniques.
4. Design and develop project plans to address real-world management challenges.
5. Aware of project management theories, tools, techniques and methods to manage the software projects at each stage of software testing life cycle.

Unit-1 Introduction **9 hours**

Introduction:Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs

Flow graphs and Path testing: Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

Unit-2 Transaction Flow Testing **9 hours**

Transaction Flow Testing: transaction flows, transaction flow testing techniques. Dataflow testing: Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing. Domain Testing: domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

Unit-3 Paths **9 hours**

Paths, Path products and Regular expressions: path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection. Logic Based Testing: overview, decision tables, path expressions, kv charts, specifications.

Unit-4 State **9 hours**

State, State Graphs and Transition testing: state graphs, good & bad state graphs, state testing, Testability tips.

Unit-5 Graph Matrices and Application **9 hours**

Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. (Student should be given an exposure to a tool like JMeter or Win-runner).

Text Books:

1. Software Testing techniques - Baris Beizer, Dreamtech, second edition.
2. Software Testing Tools – Dr. K. V. K. K. Prasad, Dreamtech.

References:

1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques – SPD(Oreille)
3. Software Testing in the Real World – Edward Kit, Pearson.

4. Effective methods of Software Testing, Perry, John Wiley.
5. Art of Software Testing – Meyers, John Wiley.

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	3	3	3	-	-	-	-	-	-	-	-	2	2
CO2	3	3	-	-	-	-	-	-	-	-	-	-	2	3
CO3	3	3	3	-	-	-	-	-	-	-	-	-	2	3
CO4	3	3	3	3	2	-	-	-	-	-	-	-	3	2
CO5	2	2	-	-	-	-	-	-	-	-	-	-	2	2

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

20ACO12	**Data Analytics for IoT**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**
	(Professional Elective -II)				

Course Outcomes:

1. Understand the fundamentals of IoT Analytics and Challenges
2. Understand and analyze IoT Devices and Networking Protocols
3. Apply IoT Analytics for the Cloud
4. Understand exploring and visualizing data

UNIT - I: **7Hrs**

Defining IoT Analytics and Challenges: Introduction to IoT, applications, IoT architectures, introduction to analytics, IoT analytics challenges.

UNIT - II: **7Hrs**

IoT Devices and Networking Protocols: IoT devices, Networking basics, IoT networking connectivity protocols, IoT networking data messaging protocols, Analyzing data to infer protocol and device characteristics.

UNIT - III: **7Hrs**

IoT Analytics for the Cloud: Introduction to elastic analytics, Decouple key components, Cloud security and analytics, Designing data processing for analytics, Applying big data technology to storage.

UNIT - IV: **5Hrs**

Exploring IoT Data: Exploring and visualizing data, Techniques to understand data quality, Basic time series analysis, Statistical analysis.

UNIT - V: **7Hrs**

Data Science for IoT Analytics: Introduction to Machine Learning, Feature engineering with IoT data, Validation methods, Understanding the bias–variance tradeoff, Use cases for deep learning with IoT data.

TEXT BOOK:

1. Minteer, Andrew, Analytics for the Internet of Things (IoT), Packt Publishing Ltd. July 2017, ISBN 9781787120730.

REFERENCE BOOKS:

1. Kai Hwang, Min Chen, Big-Data Analytics for Cloud, IoT and Cognitive Computing, Wiley.
2. Hwaiyu Geng, Internet of Things and Data Analytics Handbook, Wiley.
3. John Soldatos, Building Blocks for IoT Analytics Internet-of-Things Analytics, River

Publishers Gerardus Blokdyk.

4. IoT Analytics A Complete Guide, 5starcooks.

MAPPING:

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

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

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

		L	T	P	C
20ACO13	**WIRELESS NETWORKS**	**3**	**0**	**0**	**3**
	(Professional Elective -II)				

Course Outcomes:

1. Students will be able to understand the basis of Ad-hoc wireless networks.
2. Students will be able to understand design, operation and the performance of MAC layer protocols of Ad Hoc wireless networks.
3. Students will be able to understand design, operation and the performance of routing protocol of Ad Hoc wireless network.
4. Students will be able to understand design, operation and the performance of transport layer protocol of Ad Hoc wireless networks.
5. Students will be able to understand sensor network Architecture and will be able to distinguish between protocols used in Adhoc wireless networks and wireless sensor networks.

UNIT - I: **9Hrs**

Wireless LANs and PANs: Introduction, Fundamentals of WLANS, IEEE 802.11 Standards, HIPERLAN Standard, Bluetooth, Home RF. Ad-Hoc Wireless Networks: Introduction, Issues in Ad Hoc Wireless Networks.

UNIT - II: **9Hrs**

MAC Protocols: Introduction, Issues in Designing a MAC protocol for Ad Hoc Wireless Networks, Design goals of a MAC Protocol for Ad Hoc Wireless Networks, Classifications of MAC Protocols, Contention - Based Protocols, Contention - Based Protocols with reservation Mechanisms, Contention – Based MAC Protocols with Scheduling Mechanisms, MAC Protocols that use Directional Antennas, Other MAC Protocols.

UNIT - III: **9Hrs**

Routing Protocols: Introduction, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks, Classification of Routing Protocols, Table –Driven Routing Protocols, On – Demand Routing Protocols, Hybrid Routing Protocols, Routing Protocols with Efficient Flooding Mechanisms, Hierarchical Routing Protocols, Power – Aware Routing Protocols.

UNIT - IV: **9Hrs**

Transport Layer Protocols: Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Other Transport Layer Protocol for Ad Hoc Wireless Networks.

UNIT - V: **9Hrs**

Wireless Sensor Networks: Introduction, Sensor Network Architecture, Data Dissemination, Data

Gathering, MAC Protocols for Sensor Networks, Location Discovery, Quality of a Sensor Network, Evolving Standards, Other Issues.

TEXT BOOKS:

1. Ad Hoc Wireless Networks: Architectures and Protocols - C. Siva Ram Murthy and B.S.Manoj, 2004, PHI.

2. Wireless Ad- hoc and Sensor Networks: Protocols, Performance and Control - Jagannathan Sarangapani, CRC Press.

REFERENCE BOOKS:

1. Ad- Hoc Mobile Wireless Networks: Protocols & Systems, C.K. Toh, 1st Ed. Pearson Education.

2. Wireless Sensor Networks - C. S. Raghavendra, Krishna M. Sivalingam, 2004, Springer.

MAPPING:

	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO1	PSO2
CO1	**3**												**1**	**1**
CO2	**3**	**3**	**2**										**3**	**2**
CO3	**3**	**3**	**2**										**3**	**2**
CO4	**3**	**3**	**3**	**2**									**3**	
Average	**3**	**3**	**2.33**	**2**									**2.5**	**1.66**
Level of Correlation	**3**	**3**	**3**	**2**									**3**	**2**

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

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

MOBILE APPLICATION DEVELOPMENT FOR IOT

		L	T	P	C
20ACO14	**(Professional Elective -II)**	**3**	**0**	**0**	**3**

Course Outcomes:

1. Understand significance of IoT programming fundamentals.
2. Understand and analyze IoT programming applications.
3. Develops IoT applications using standardized hardware.
4. Discuss concepts of IoT Advance Wireless Interfaces and IoT Production System.

UNIT – I **9Hrs**

IoT Product Conceptualization: IoT Product Development Lifecycle, IoT Product Conceptualizations IoT Programming Fundamentals: Getting Started, IoT Programming setup for LED flashing, Program to display message on screen, Program to read LDR level and display on screen, Android APK to perform read write operation, Particle android APK to control LED intensity, LED switching with HTML interface, Cloud based motion detection, Displaying temperature sensor data on terminal, Publishing sensor values on the cloud, Performing computation on sensor values.

UNIT – II **9Hrs**

IoT Programming Applications: Gas level detection using MQ2 sensor, Blink Android Application for controlling LED from mobile, Integration of Temperature and Gas Sensor with Blynk Mobile Application, Printing real-time Date and Time values on serial terminal, Display temperature value on serial terminal, Display temperature values on 16*2 LCD display

Interfacing: Interfacing of Nokia 5110 display, display image on Nokia 5110, Particle Electron displaying battery charging level status, GPS tracking device interface to get coordinates.

UNIT – III **7Hrs**

IoT Product Hardware Development: Product realization, Connection diagram of IoT product,

Engineering board development, Product board customization and optimization, Flowchart of IoT warehouse monitoring system, Wireless communication between the multiple kits, Particle cloud IDE.

UNIT – IV **7Hrs**

IoT Advance Wireless Interfaces: Bluetooth communication between master and slave module, Data visualization on ThingSpeak cloud using webhook services, Storing data into google excel sheet and sending the sheets to emails.

UNIT – V **7Hrs**

IoT Production System: IoT Warehouse Monitoring System, IoT Product Packaging, Future of IoT Product Development.

TEXT BOOK:

1. IoT Product Development with Programming: Stepwise programming approach with Particle Development board Kindle Edition by Mahesh Jadhav and Tejas Sarang Patil.

REFERENCE BOOKS:

1. Kale, Vivek. Parallel Computing Architectures and APIs: IoT Big Data Stream Processing 1st edition, CRC Press, 2019.

2. IoT Product Development with Programming: Stepwise programming approach with Particle Development board Kindle Edition by Mahesh Jadhav and Tejas Sarang Patil.

MAPPING

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

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

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

20ACE36	**DISASTER MANAGEMENT**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

(Open Elective -II)

COURSE OUTCOMES:

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

1. Understand about the natural hazards and its management
2. Explain the effect of the fire hazards and solid waste management
3. Interpret the regulations of building codes and land use planning related to risk and vulnerability
4. Involve in the process of disaster management
5. Plan the strategies for risk reduction in schools and communities.

UNIT – I **9 hrs**

Natural Hazards and Disaster Management: Introduction of DM–Inter disciplinary-nature of the subject–Disaster Management cycle–Five priorities for action. Case study methods of the following: floods, draughts – Earth quakes – global warming, cyclones & Tsunamis – Post Tsunamihazards along the Indian coast– land slides.

UNIT – II **9 hrs**

Man Made DisasterAnd Their Management Along With Case Study Methods Of The Following: Firehazards–transport hazard dynamics–solid waste management–post disaster – bio terrorism - threat in mega cities, rail and air craft's accidents, and Emerging infectious diseases &Aids and their management.

UNIT – III **9 hrs**

Risk and Vulnerability: Building codes and land use planning–social vulnerability–environmental vulnerability – Macroeconomic management and sustainable development, climate change risk rendition– financial management of disaster – related losses.

UNIT – IV **9 hrs**

Role of Technology In Disaster Managements: Disaster management for infra structures, taxonomy of infra structure – treatment plants and process facilities-electrical substations-roads and bridges-mitigation programme for earth quakes –flowchart, geospatial informationin agriculture drought assessment-multimedia technology in disaster risk management and training transformable indigenous knowledgein disaster reduction.

UNIT V **9 hrs**

Education and Community Preparedness: Education in disaster risk reduction-Essentials of school disaster education-Community capacity and disaster resilience-Community based disaster recovery -Community based disaster management and social capital-Designing resilience building community capacity for action.

TEXT BOOKS:

1. Rajib shah & R R Krishnamurthy "Disaster Management"–Global Challenges and Local Solutions' Universities press.(2009),
2. Tushar Bhattacharya,"Disaster Science & Management" Tata Mc Graw Hill Education Pvt. Ltd., New Delhi.
3. Jagbir Singh"Disaster Management"–Future Challenges and Opportunities' IK International Publishing House Pvt.Ltd. (2007).

REFERENCE BOOKS:

1. Harsh.K.Gupta " Disaster Management edited ", Universities press, 2003.

MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3					3		3	3		3	3	
CO2	2	2					2		3	3		3	3	
CO3	2	2					2		3	3		3	3	
CO4	2	2					2		3	3		3	3	
CO5	2	2					2		3	3		3	3	
Average	2	2					2		3	3		3	3	
Level of Correlation	2	2					2		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 CSO
(Common to ME, CSE, IT, CE,EEE,CSE (AI&ML) & CSE (DS))
III B.Tech I Semester

		L	T	P	C
20AMB09	**INTELLECTUAL PROPERTY RIGHTS**	**3**	**0**	**0**	**3**
	(Open Elective -II)				

COURSE OUTCOMES:

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

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

UNIT - I: UNDERSTANDING AND OVERVIEW OF IPR: **7Hrs**

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

UNIT-II: COPYRIGHT ACT, 1957: **7Hrs**

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: **7Hrs**

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: **7Hrs**

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: **7Hrs**

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

TEXT BOOKS:

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

REFERENCES:

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

Mapping:

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

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

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

		L	T	P	C
20AME31	**Operations Research (Open Elective – II)**	**3**	**0**	**0**	**3**

Course Outcomes:

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

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

UNIT: I Introduction and Liner programming 12 Hours

Development – definition – characteristics and phases – types of Operations Research models – applications – limitations.

Linear Programming and its Applications: Linear Programming Problem – Graphical solution of LP Problems. Simplex method – artificial variables techniques - Two phase method, - Big M method

UNIT: II Transportation and Assignment problems 12 Hours

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

UNIT: III Replacement and waiting line problems 12 Hours

Replacement: Introduction – replacement of items that deteriorate with time – when money value is not counted and counted – replacement of items that fail completely, group replacement, Waiting lines. Introduction, single channel Poisson arrival, exponential service time with finite population and infinite population.

UNIT: IV Simulation and Theory of Games 12 Hours

Simulation Definition – types of simulation models – phases of simulation – application of simulation– inventory and queuing problems – merits and demerits -- simulation languages.

Theory of Games: Introduction – mini, max (max, mini) – criterion and optimal strategy-- to solve the rectangular two-person zero sum games, solution of rectangular games in terms of mixed strategies, solution of 2x2 games without saddle point, solution of a two person zero sum 2Xn game, Graphical method for 2Xn and nX2 games.

UNIT: V Network Models and Project Management 12 Hours

Network models - Introduction, Rules for construction and errors. Shortest route - Dijkstra's algorithm, Minimal spanning tree - Kruskal's algorithm, Maximum flow models. Project management- CPM and PERT networks.

Textbook(s)

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

Reference Books

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

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

Mapping

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

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

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

		L	T	P	C
20ACM13	**BUSINESS INTELLIGENCE**	**3**	**0**	**0**	**3**
	(Job Oriented Elective -II)				

Course Outcome

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

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

Unit -I Introduction to Business Intelligence 9hrs

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

Unit -II Business Intelligence Life Cycle 9hrs

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

Unit-III Business Intelligence User Model 9hrs

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

Unit-IV Business Intelligence Issues and Challenges 9hrs

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

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

Unit-V Business Intelligence Strategy and Road Map 9hrs

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

Text books

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

Reference Books

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

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2										3	2
CO2	3	3	1										3	3
CO3	3	3	1										2	2
CO4	3	3	2										3	1
Average	3	3	1.5										2.75	2
Level of correlation	3	3	2										3	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester CSO & CSE
III B.Tech II Semester ME(Open Elective-II)

20ACS34	**MACHINE LEARNING**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

(Job Oriented Elective -II)

COURSE OUTCOMES:

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

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

UNIT I 9hrs

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

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

UNIT II 9hrs

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

UNIT III 9hrs

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

UNIT IV 9hrs

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

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

UNIT V 9hrs

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

Text Books

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

References

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

Mapping

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

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

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

20ACO15 IOT COMMUNICATION PROTOCOL LAB

L	T	P	C
0	0	3	1.5

Course outcomes:
To get familiar with the IoT keychain value:

1. From the device to the cloud
2. Implement interfacing of various sensors with Arduino/Raspberry Pi.
3. Show an ability to upload/download sensor data on cloud and server.

List of Experiments:

- Message Queuing Telemetry Transport (MQTT)
- Get started with Scaleway IoT Hub
- MQTT Explorer
- Microcontroller
- Connecting your ESP8266 to Scaleway IoT Hub
- Control a LED and display temperature
- Humidity and Temperature
- Interact with the LED

Reference: https://github.com/luisomoreau/IoT-Communication-Protocols-Lab-1

Mapping:

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

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

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

20ACO16 Computer Vision and Robotic Lab

L	T	P	C
0	0	3	1.5

Course Outcomes:

The students will be able to

1. use fundamental and technical knowledge of robot Programming
2. learn Robot Programming using teach Pendant for various applications
3. use RAPID Language and AML
4. Program using Robot studio software

LIST OF EXPERIMENTS

1. Robot Programming using Flex Pendant- Lead through programming including Coordinate systems of Robot,
2. Wrist Mechanism-Interpolation-Interlock commands
3. VAL language commands motion control, hand control, program control, pick and place applications,
4. Palletizing applications using VAL,
5. Object detection and Sorting
6. Robot welding application using VAL program
7. RAPID Language and AML
8. Programming using Robot studio software

Mapping:

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

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

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

20ACO17 PROGRAMMING FOR IOT BOARDS LAB

L	T	P	C
0	0	3	1.5

Course Outcomes:
At the end of this course, student will be able to:
1. Use open-source hardware prototyping platform and peripherals for building digital devices and interactive objects that can sense and control the physical world.
2. Program SBC for practical IoT devices using Python and explore protocols, data conversion process, API's and
3. Expansion boards for real world interaction.

List of Experiments
1.Introduction to IoT Development Kit and Development Environment
2.Internet Controlled LEDs
3.Temperature Logger
4.Home Automation
5.Soil Moisture Sensor
6.Light Color Control
7.Home Security System
8.Parking Sensor
9.Motor Control
10.Water Level Control
11.Street Light Control

Text Book(s)
1.Yamanoor, Sai, and Srihari Yamanoor. Python Programming with Raspberry Pi, 2017,1st edition, Packt Publishing Ltd, UK.
2.Donald Norris, The Internet of Things: Do-It-Yourself Projects with Arduino, Raspberry Pi, and BeagleBone Black, 2015,1st edition, McGraw Hill Education, USA.
Reference Books
1.Schwartz, Marco. Home Automation with Arduino: Automate your Home using Open-Source Hardware. 2013, 1st Edition, CreateSpace Independent Publishing, USA.
2.Kooijman, Matthijs. Building Wireless Sensor Networks Using Arduino, 2015, 1st edition, Packt Publishing Ltd, UK.

Mapping:

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

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

III B.Tech II Semester

L	T	P	C
1	0	2	2

20AIT19 INTRODUCTION TO PROGRAMMING AND ANIMATION WITH ALICE (Skill Course)

COURSE OUTCOMES:

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

CO1 : Understand the overview of Alice and moving objects controls

CO2 : Construct and designing the storyboard

CO3 : Understand the object movement with different orientations

CO4 : Understanding the Practicing Random Numbers and Variables

CO5 : Identify the Guessing Game with arrays

LIST OF EXPERIMENTS

1. Adding Objects to a Scene
2. Moving Objects Around: Controls, Keys, and One-shot (Mac version
3. Build a Simple World
4. More Control and Comparing Instructions
5. Implementing the Storyboard
6. Object Control Document
7. How Objects and Parts Turn and Roll
8. BunnyHop Multiple Ways

TEXT BOOK:

1. ALICE 3 IN ACTION: COMPUTING THROUGH ANIMATION", Second Edition by Joel Adams Cengage Learning, 15-Jan-2014
2.

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

20AHS23	**ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE**	**L**	**T**	**P**	**C**
		2	**0**	**0**	**0**

Course Outcomes:

At the end of the Course, Student will be able to:

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

UNIT I

INTRODUCTION TO TRADITIONAL KNOWLEDGE **7Hrs**

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 **7Hrs**

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 **7Hrs**

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 **7Hrs**

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 7Hrs

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

Text Book:

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

Reference Books:

1. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002.
2. "Knowledge Traditions and Practices of India" Kapil Kapoor1, Michel Danino2.

Web Links:

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

Mappping:

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

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