MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

B.Tech –C S E (Data Science)

Course Structure (R20)
Applicable From 2020-21 Admitted Batch
Structure Breakup

S. No	Category	Breakup of credits (Total160credits)
1	Humanities and Social Sciences including Management courses(HSMC)	10
2	Basic Sciences Courses(BS)	22
3	Engineering Sciences courses including Workshop, Drawing basics of electrical/mechanical/computer etc.(ES)	19
4	Professional Core courses(PC)	69
5	Professional Electives(PE)	18
6	Open Electives(OE)	9
7	Project work, Seminar and Internship in industry or else where(PS)	13
8	Mandatory Courses	-
	TOTAL	**160**

I YEAR I SEMESTER

S. No.	Course Code	Course Name	Course Area	Periods per week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2010001	Engineering Mathematics - I	BS	3	1	0	4	30	70	100
2	2010006	Applied Physics	BS	3	1	0	4	30	70	100
3	2010501	Programming for Problem Solving	ES	3	1	0	4	30	70	100
4	2010009	Communicative English	HSMC	2	0	0	2	30	70	100
5	2010071	Applied Physics Lab	BS	0	0	3	1.5	30	70	100
6	2010571	Programming for Problem Solving Lab	ES	0	0	3	1.5	30	70	100
7	2010074	Communicative English Lab	HSMC	0	0	2	1	30	70	100
TOTAL				**11**	**3**	**8**	**18**	**210**	**490**	**700**

I YEAR II SEMESTER

S. No.	Course Code	Course Name	Course Area	Periods per week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2020002	Engineering Mathematics - II	BS	3	1	0	4	30	70	100
2	2020008	Engineering Chemistry	BS	3	1	0	4	30	70	100
3	2020502	Data Structures	ES	3	0	0	3	30	70	100
4	2020371	Engineering Drawing practice	ES	1	0	4	3	30	70	100
5	2020073	Engineering Chemistry Lab	BS	0	0	3	1.5	30	70	100
6	2020572	Data Structures Lab	ES	0	0	2	1	30	70	100
7	2020372	Engineering Workshop	ES	1	0	3	2.5	30	70	100
8	2020021	Environmental Science	MC	2	0	0	0	-	-	-
TOTAL				**13**	**2**	**12**	**19**	**210**	**490**	**700**

***MC-Satisfactory/Unsatisfactory**

II YEAR I SEMESTER

S. No.	Course Code	Course Name	Course Area	Periods per week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2030503	Database Management Systems	PC	3	0	0	3	30	70	100
2	2030510	Operating Systems	PC	3	0	0	3	30	70	100
3	2036201	Digital Logic Design & computer Organization	PC	3	1	0	4	30	70	100
4	2030004	Probability & Statistics	BS	3	0	0	3	30	70	100
5	2030505	Python Programming	PC	3	0	0	3	30	70	100
6	2030579	Operating Systems Lab	PC	0	0	3	1.5	30	70	100
7	2030573	Database Management Systems Lab	PC	0	0	3	1.5	30	70	100
8	2030575	Python Programming Lab	PC	0	0	3	1.5	30	70	100
9	2030022	Gender Sensitization	MC	2	0	0	0	-	-	-
TOTAL				**17**	**1**	**9**	**20.5**	**240**	**560**	**800**

II YEAR II SEMESTER

S. No.	Course Code	Course Name	Course Area	Periods per week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2040506	Discrete Mathematics	PC	3	1	0	4	30	70	100
2	2040201	Basic Electrical Engineering	ES	3	0	0	3	30	70	100
3	2040010	Business Economics and Financial Analysis	HSMC	3	0	0	3	30	70	100
4	2040509	JAVA Programming	PC	3	0	0	3	30	70	100
5	2046701	Introduction to Data Science	PC	3	0	0	3	30	70	100
6	2046702	Data Warehousing & Data Mining	PC	2	0	0	2	30	70	100
7	2040271	Basic Electrical Engineering Lab	ES	0	0	2	1	30	70	100
8	2046771	Data Warehousing & Data Mining Lab	PC	0	0	2	1	30	70	100
9	2046672	JAVA Programming Lab	PC	0	0	3	1.5	30	70	100
10	2040023	Constitution of India	MC	2	0	0	0	-	-	-
TOTAL				**17**	**2**	**7**	**20.5**	**240**	**560**	**800**

***MC-Satisfactory/Unsatisfactory**

III YEAR I SEMESTER

S. No.	Course Code	Course Name	Course Area	Periods per week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2050511	Computer networks	PC	3	0	0	3	30	70	100
2	2050518	Machine Learning	PC	3	0	0	3	30	70	100
3	2050508	Design and Analysis of Algorithms	PC	3	0	0	3	30	70	100
4	2050513	Software Engineering	PC	3	0	0	3	30	70	100
5		Open elective-I	OE	3	0	0	3	30	70	100
6	2050578	Computer networks Lab	PC	0	0	3	1.5	30	70	100
7	2050584	Machine Learning Lab using Python	PC	0	0	3	1.5	30	70	100
8	2056673	Case Tools Lab	PC	0	0	2	1	30	70	100
9	2020024	Intellectual Property Rights	MC	2	0	0	0	-	-	-
TOTAL				**17**	**0**	**8**	**19**	**240**	**560**	**800**

III YEAR II SEMESTER

S. No.	Course Code	Course Name	Course Area	Periods per week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2066602	Automata Theory & Language Processors	PC	3	0	0	3	30	70	100
2	2060556	Data Analytics	PC	3	0	0	3	30	70	100
3	2060516	Web Technology	PC	3	1	0	4	30	70	100
4		Professional Elective I	PE	3	0	0	3	30	70	100
5		Open Elective II	OE	3	0	0	3	30	70	100
6	2060582	Web Technology Lab	PC	0	0	3	1.5	30	70	100
7	2066772	Data analytics Lab	PC	0	0	3	1.5	30	70	100
8	2060075	Advanced English Communication Lab	HSMC	0	0	2	1	30	70	100
9		Professional Ethics	MC	2	0	0	0	-	-	-
TOTAL				**17**	**1**	**8**	**20**	**240**	**560**	**800**

***MC-Satisfactory/Unsatisfactory**

IV Year – I Semester

S. No.	Course Code	Course Name	Course Area	Periods per week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2070011	Fundamentals of Management	HSMC	3	0	0	3	30	70	100
2	2076703	Business intelligence	PC	3	0	0	3	30	70	100
3	2070558	Deep Learning	PC	3	0	0	3	30	70	100
4		Professional Elective II	PE	3	0	0	3	30	70	100
5		Professional Elective III	PE	3	0	0	3	30	70	100
6		Open Elective III	OE	3	0	0	3	30	70	100
7	2076773	Business intelligence Lab	PC	0	0	3	1	30	70	100
8	2076675	Deep learning lab	PC	0	0	3	1	30	70	100
9	2070585	Industry Oriented Mini Project/ Summer Internship*	PS	0	0	4	2	30	70	100
10	2070586	Project Stage-I	PS	0	0	6	3	30	70	100
TOTAL				**18**	**0**	**16**	**26**	**300**	**700**	**1000**

IV Year – II Semester

S. No.	Course Code	Course Name	Course Area	Periods per week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1		Professional Elective V	PE	3	0	0	3	30	70	100
2		Professional Elective VI	PE	3	0	0	3	30	70	100
3		Open Elective III	OE	3	0	0	3	30	70	100
4	2080587	Technical Seminar	PS	0	0	2	1	100	-	100
5	2080588	Project Stage-II	PS	0	0	14	7	30	70	100
TOTAL				**9**	**0**	**16**	**17**	**220**	**280**	**500**

***Students have to complete industry oriented mini project in III Year- II Semester Summer break, Evaluation is carried in IV-I semester.**

PE I - Professional Elective I

S.No	Course Code	Course Title
1	2060541	Embedded Systems
2	2060542	Computer Graphics
3	2066741	Parallel Computing
4	2060543	Artificial Intelligence

PE II - Professional Elective II

S.No	Course Code	Course Title
1	2070545	Linux Programming
2	2070553	Distributed System
3	2070547	Cryptography and Network Security
4	2070548	Software project Management

PE III – Professional Elective III

S.No	Course Code	Course Title
1	2070549	Wireless Sensor Networks
2	2070550	Design Thinking
3	2070551	Cyber Forensics
4	2076743	Image and Video Processing

PE IV - Professional Elective

S.No	Course Code	Course Title
1	2080546	Mobile Computing
2	2080552	Natural Language Processing
3	2080555	Semantic Web
4	2086744	Big Data Analytics

PE V - Professional Elective V

S.No	Course Code	Course Title
1	2080557	Artificial Neural Networks
2	2086745	Middleware Technologies
3	2080559	Virtual Reality
4	2080560	Block Chain Technology

PE VI - Professional Elective VI

S.No	Course Code	Course Title
1	2080561	Robotics
2	2086746	Cloud Computing
3	2080563	Web Services
4	2080517	Internet of Things

Open Electives

	Course Code	Course Title
1	Open Elective 1	2050509- Java Programming
		2050503- Database Management System
2	Open Elective 2	2060556- Data Analytics
		2060518-Machine Learning
3	Open Elective 3	2070558- Deep Learning
		2076604- R Programming

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2010001: ENGINEERING MATHEMATICS - I

I Year B.Tech. DS I – Sem. **L T P C**

3 1 0 4

Course Objectives:

- Types of matrices and their properties, Concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
- Concept of Eigen values and eigen vectors and to reduce the quadratic form to canonical form.
- Geometrical approach to the mean value theorems and their application to the mathematical problems.
- Partial differentiation, concept of total derivative, finding maxima and minima of function of two and three variables.
- The evaluation of Multiple integration and its applications

Course Outcomes: At the end of this course, students will be able to

- **CO.1**: Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
- **CO.2**: Find the Eigen values, Eigen vectors and reduce the quadratic form to canonical form using orthogonal transformations.
- **CO.3:** Solve the applications on the mean value theorems.
- **CO.4:** Find the extreme values of functions of two variables with/ without constraints.
- **CO.5**: Evaluate the multiple integrals and apply the concept to find areas, volumes for cubes, sphere and rectangular parallelepiped.

UNIT-I: Matrices

Matrices: Types of Matrices, Symmetric ;Skew-symmetric; orthogonal matrices; rank of a matrix by Echelon form, Normal form, Inverse of Non-singular matrices by Gauss-Jordan method; System of linear equations; solving system of Homogeneous and Non-Homogeneous equations. Gauss elimination method, Gauss seidel iteration method.

UNIT-II: Eigen values and Eigenvectors

Eigen values and Eigen vectors and their properties: Diagonalization of a matrix; Cayley-Hamilton Theorem (without proof); finding inverse and power of a matrix by Cayley-Hamilton Theorem; Quadratic forms up to three variables. Nature of the Quadratic Forms; Reduction of Quadratic form to canonical forms by Orthogonal Transformation.

UNIT-III: Calculus of single variable

Mean value theorems: Rolle's Theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem. Taylor's and Maclaurin theorems with remainders (without proof). Beta and Gamma functions and their applications.

UNIT-IV: Multivariable Calculus

Partial Differentiation; Euler's Theorem; Total derivative; Jacobian; Functional dependence, independence, Maxima and minima of functions of two variables and three variables using

method of Lagrange multipliers.

UNIT-V: Multiple integrals& applications

Evaluation of Double integrals (Cartesian and polar coordinates); Change of order of integration (Cartesian form); Evaluation of Triple integrals; Change of variables (Cartesian to polar) for double and (cartesian to spherical and cylindrical polar coordinates) for triple integrals.

Applications: finding the area of a region using double integration and volume of a region using double and triple integration.

TEXTBOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006.

REFERENCES:

1. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
2. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11thReprint, 2010.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2020006: APPLIED PHYSICS

I Year B.Tech. DS I – Sem. **L T P C**

3 1 0 4

Course Objectives:

- Students will demonstrate skills in scientific inquiry, problem solving and laboratory techniques.
- Students will be able to demonstrate competency and understanding of the concepts found in Quantum Mechanics, Fiber optics and lasers, Semiconductor physics, opto electronics and dielectric and magnetic properties and a broad base of knowledge in physics.
- The graduates will be able to solve non-traditional problems that potentially draw on knowledge in multiple areas of physics.
- To study applications in engineering like memory devices, transformer core and electromagnetic machinery.

Course Outcomes: At the end of this course, students will be able to

- The student would be able to learn the fundamental concepts on Quantum behavior of matter in its micro state.
- The knowledge of fundamentals of Semiconductor devices and their applications.
- Design, characterization and study of properties of optoelectronic devices help the students to prepare new materials for various engineering applications.
- Study about Lasers and fiber optics which enable the students to apply to various systems involved with communications.
- The course also helps the students to be exposed to the phenomena of dielectric and magnetic properties.

UNIT-I: Quantum Mechanics

Introduction to quantum physics, Black body radiation, Photoelectric effect, de-Broglie's hypothesis, Wave-particle duality, Davisson and Germer experiment, Heisenberg's Uncertainty principle, Born's interpretation of the wave function, Schrodinger's time independent wave equation, Particle in one dimensional box.

Learning Outcomes:

- **Understand** the fundamental concepts of quantum mechanics.
- **Explain** the physical significance of wave function.
- **Apply** Schrödinger's wave equation for a free particle.
- **Analyze** the particle behavior in different potential regions.
- **Evaluate** the significance of energy values in one dimensional box.

UNIT-II: Semiconductor Physics

Intrinsic and Extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature, Carrier transport: diffusion and drift, p-n junction diode, Zener diode and their V-I Characteristics, Bipolar Junction Transistor (BJT): Construction, Principle of operation, Hall effect.

Learning Outcomes:

- **Understand** the energy band formation of semiconductors.
- **Explain** the properties of n-type and p-type semiconductors.
- **Apply** the Hall effect for various types of semiconductors.
- **Analyze** the various types of diodes**.**
- **Evaluate** the hall coefficient of semiconductors.

UNIT-III: Optoelectronics

Radioative and non-radiative recombination mechanisms in semiconductors, LED : Device structure, Materials, Characteristics and figures of merit, Semiconductor photo detectors: Solar cell, PIN and Avalanche photodiode and their structure, working principle and Characteristics.

Learning Outcomes:

- **Understand** the basic principle involved in LED.
- **Explain** about various types of photodiodes.
- **Apply** the knowledge on various diodes.
- **Analyze** the working of PIN and Avalanche diodes.
- **Evaluate** the characteristics of diodes**.**

UNIT-IV: Lasers and Fibre Optics

Lasers: Introduction to Lasers, Coherence, Population inversion, Pumping, Lasing action, Types of **Lasers**: Ruby laser, Carbon dioxide (CO_2) laser, He-Ne laser, Semiconductor laser; Applications of laser.

Fibre Optics: Introduction, Block diagram of fiber optic communication system, Total internal reflection, Acceptance angle and Numerical aperture, Step and Graded index fibres, Losses associated with optical fibres, Applications of optical fibres.

Learning Outcomes:

- **Understand** about Laser and fiber optics.
- **Explain** the working principle of laser and optical fibers.
- **Apply** optical fibers in communication system.
- **Analyze** the applications of optical fibers in medical, communication and other fields.
- **Evaluate** the laser and fiber optic concepts in various fields.

UNIT-V: Dielctric and Magnetic Properties

Dielectric properties: Introduction to dielectrics, Polarisation, Permittivity and Dielectric constant, Types of polarisation (Qualitative), Internal fields in a solid, Clausius- Mossotti equation, Ferroelectrics and Piezoelectrics.

Magnetic properties: Introduction to magnetism, Magnetisation, permeability and susceptibility, Classification of magnetic materials, Domain theory of ferro magnetism, Hysteresis, Applications of magnetic materials.

Learning Outcomes:

- **Understand** the concept of polarization in dielectric materials.
- **Explain** various types of polarization of dielectrics and classification of magnetic materials.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

- **Apply** Lorentz field and Claussius- Mosotti relation in dielectrics.
- **Analyze** the ferromagenetism on the basis of domain theory.
- **Evaluate** the applications of dielectric and magnetic materials**.**

TEXT MBOOKS:

1. Engineering Physics, B.K. Pandey, S. Chaturvedi – Cengage Learing.
2. Halliday and Resnick, Physics - Wiley.
3. A textbook of Engineering Physics, Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar - S. Chand

REFERENCES:

1. Richard Robinett, Quantum Mechanics
2. J. Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw-Hill inc. (1995). Online Course: “Optoelectronic Materials and Devices” by Monica Katiyar and Deepak Guptha on NPTEL.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2010501: PROGRAMMNG FOR PROBLEM SOLVING

I Year B.Tech. DS I – Sem.	**L**	**T**	**P**	**C**
	3	**1**	**0**	**4**

Course Objectives:

- To learn the fundamentals of computers.
- To understand the various steps in program development.
- To learn the syntax and semantics of C programming language.
- To learn the usage of structured programming approach in solving problems.

Course Outcomes: At the end of this course, students will be able to

- To write algorithms and to draw flowcharts for solving problems.
- To convert the algorithms/flowcharts to C programs.
- To code and test a given logic in C programming language.
- To decompose a problem into functions and to develop modular reusable code.
- Searching and sorting problems.

UNIT-I:Introduction to Programming

Introduction to computers: disks, primary and secondary memory, processor, operating system, compilers, creating and running of program, Number systems, Pseudo code, algorithm, flowchart.

Introduction to C Programming Language: Basic structure of C program, Syntax and Logical Errors in compilation, "C" tokens: Identifiers, variables, Data types, Operators(Arithmetic, Relational, Logical, Bit-wise, Increment and Decrement, size of, Conditional operator, Assignment, Special operator), expressions and precedence, Expression evaluation, Precedence and Associativity, type conversion, Command line arguments.

UNIT-II: Control statements, Arrays

Conditional statements: Writing and evaluation of conditionals and consequent branching with if, if-else, nested if-else and switch statements.

Iterative Statements: while, do-while, for, Nested loops

Jumping Statements: break, continue and goto

I/O: Simple input and output with scanf and printf, formatted I/O, stdin, stdout, stderr.

Arrays: Types of arrays, creating, accessing and manipulating elements of arrays.

UNIT-III: Strings, structures and Unions, Pointers

Strings: Introduction to strings, handling strings as array of characters, string I/O functions, string handling functions, arrays of strings

Structures and unions: Defining structures, Initializing structures, Array of structures, nested structures, Bit Fields, unions.

Pointers: Defining pointers, Address and Indirection operators, pointers to arrays and structures, use of pointers in self-referential structures, Enumeration Data types

UNIT-IV: Functions and Dynamic Memory Allocation

Functions: Designing structured programs, Declaring a function, Signature of a function, Parameters and return type of a function, passing parameters to functions, call by value, Passing

arrays to functions, call by reference, void function, Structure to functions, Some C standard functions and libraries, Storage classes (auto, extern, static and register)

Recursion: Simple programs, such as Finding Factorial, Fibonacci series etc., Limitations of Recursive functions

Dynamic Memory Allocation: Allocating and freeing memory, Allocating memory for arrays of different data types.

UNIT-V: Preprocessors and File Handling in C

Preprocessor: Commonly used Preprocessor commands like include, define, undef, if, ifdef, ifndef.

Files: Text and Binary files, File structure, Creating, Reading and Writing text and binary files, Appending data to existing files, Writing and Reading structures using binary files, File Status functions, File Positioning functions**.**

TEXT BOOKS:

1. B.A.ForouzanandR.F.GilbergCProgrammingandDataStructures,CengageLearning,(3rdEdition)
2. Letus CbyYashavantKanetkarBPBpublications (16thEdition)

REFERENCES:

1. Programming in ANSI C by Balaguruswamy,(7th Edition)
2. Brian W.Kernighan and Dennis M.Ritchie, The C Programming Language, Prentice Hall of India
3. R.G.Dromey, How to solve it by Computer, Pearson(16thImpression)
4. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education Herbert Schildt, C:The Complete Reference,McGrawHill,4thEdition

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2010009 : COMMUNICATIVE ENGLISH

I Year B.Tech. DS I – Sem. **L T P C**

2 0 0 2

Course Objectives:

- Improve language proficiency with emphasis on Vocabulary, Grammar, Reading and Writing skills.
- Apply the theoretical and practical components of English syllabus to study academic subjects more effectively and critically.
- Analyze a variety of texts and interpret them to demonstrate in writing or speech.
- Write clearly and creatively, and adjust writing style appropriately to the content, the context, and nature of the subject.
- Develop language components to communicate effectively in formal and informal situations

Course Outcomes: At the end of this course, students will be able to

- Use English Language effectively in spoken and written forms.
- Comprehend the given texts and respond appropriately.
- Communicate confidently in various contexts in their profession.
- Acquire basic proficiency in English including LSRW skills.
- Use prewriting techniques to develop ideas and produce multiple drafts of different types of paragraphs.
- Recognize and incorporate basic grammar, mechanics, and sentence variety in writing.

UNIT-I:

'The Raman Effect' from the prescribed textbook 'English for Engineers' published by Cambridge University Press

Vocabulary Building: The Concept of Word Formation --The Use of Prefixes and Suffixes.

Grammar: Common Errors: Articles and Prepositions.

Reading: Reading and Its Importance- Techniques for Effective Reading.

Basic Writing Skills: Sentence Structures -Use of Phrases and Clauses in Sentences- Importance of Proper Punctuation- Techniques for writing precisely – Paragraph writing – Types, Structures and Features of a Paragraph - Creating Coherence-Organizing Principles of Paragraphs in Documents.

Learning Outcomes: At the end of the module, the learners will be able to

- Understand the concept of word formation, root words and their usage in English.
- Know the types of sentences and analyze the sentence structure
- Use articles and prepositions appropriately
- Use punctuation marks correctly in writing
- Understand the techniques of effective reading
- Write paragraphs effectively

UNIT-II: Synonyms and Antonyms.
Grammar: Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject-verb Agreement.
Reading: Improving Comprehension Skills – Techniques for Good Comprehension
Writing: Format of a Formal Letter-Writing Formal Letters E.g.., Letter of Complaint, Letter of Requisition, and Job Application with Resume.

Learning Outcomes: At the end of the module, the learners will be able to

- Enrich their vocabulary using synonyms and antonyms
- Noun ,pronoun and subject verb agreement accurately
- understand the techniques of reading comprehension
- write formal letters in various context

UNIT-III: 'Blue Jeans' from the prescribed textbook 'English for Engineers' published by Cambridge University Press
Vocabulary: Acquaintance with Prefixes and Suffixes from Foreign Languages in English to form Derivatives-Words from Foreign Languages and their Use in English.
Grammar: Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses. **Reading**: Sub-skills of Reading- Skimming and Scanning
Writing: Nature and Style of Sensible Writing- Defining- Describing Objects, Places and Events – Classifying- Providing Examples or Evidence

Learning Outcomes: At the end of the module, the learners will be able to

- Use Prefixes and Suffixes from Foreign Languages in English
- Understand the use misplaced modifiers and uses of tenses
- Skim and scan the given text appropriately
- Write definitions, descriptions and classifications

UNIT –IV: 'What Should You Be Eating' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.
Vocabulary: Standard Abbreviations in English
Grammar: Redundancies and Clichés in Oral and Written Communication.
Reading: Comprehension- Intensive Reading and Extensive Reading
Writing: Writing Practices--Writing Introduction and Conclusion - Essay Writing-Précis Writing.

Learning Outcomes: At the end of the module, the learners will be able to

- Understand the importance of food pyramid in your daily life.
- Explain the Active and passive Voice Subject Verb Agreement (Concord)
- Apply the One word Substitutes in your every day vocabulary.
- Analyze the Intensive and Extensive reading skills.
- Evaluate the importance of Technical Report Writing, and E-mail writing

UNIT –V: 'How a Chinese Billionaire Built Her Fortune' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.
Vocabulary: Technical Vocabulary and their usage

Grammar: Common Errors in English
Reading: Reading Comprehension-Exercises for Practice
Writing: Technical Reports- Introduction – Characteristics of a Report – Categories of Reports Formats- Structure of Reports (Manuscript Format) -Types of Reports - Writing a Report.

Learning Outcomes: At the end of the module, the learners will be able to

- Understand the Technical Vocabulary and their Usage.
- Avoid common errors in English
- Read any text using the sub skills of reading
- Write technical reports using manual script format

TEXT BOOKS:

1. Sudarshan, N. P. and Savitha, C. (2018). English for Engineers, Cambridge University Press
2. Wren & Martin. (2017). High School English Grammar and Composition Book, S Chand Publishing.

REFERENCES:

1. Murphy ,R.(2015).Essential Grammar in Use. Cambridge University Press.
2. Current English Grammar and Usage with Composition by R. P Sinha
3. Wood ,F.T.(2007).Remedial English Grammar. Macmillan.
4. Swan, M. (2016). Practical English Usage. Oxford University Press.
5. Exercises in Spoken English. Parts I–III. CIEFL, Hyderabad. Oxford University Press

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2020071: APPLIED PHYSICS LAB

I Year B.Tech. DS I – Sem.	L	T	P	C
	0	0	3	1.5

Course Objectives:

- To gain practical knowledge by applying the experimental methods to correlate with the theoretical knowledge of physics concepts.
- To learn the usage of electrical and optical systems for measurements.
- Apply the analytical techniques and graphical analysis to the experimental data.
- To develop intellectual communication skills through discussion on basic principles of scientific concepts in a group**.**

Course Outcomes:

- Understand the concepts of the error and analysis.
- Explain the different measuring devices and meters to record the data with precision.
- Apply the experimental skills to design new experiments in engineering.
- Analyze the theoretical knowledge and correlate with the experiment.
- Evaluate the various parameters accurately.

List of Experiments:

1. Energy gap of P-N junction diode:To determine the energy gap of a semiconductor diode.
2. Solar Cell:To study the V-I Characteristics of solar cell.
3. Photoelectric effect:To determine work function of a given material.
4. Light emitting diode:Plot V-I and P-I characteristics of light emitting diode.
5. LASER:To study the V-I characteristics of LASER sources.
6. Optical fibre: To determine the Numerical aperture and bending losses of Optical fibers
7. Stewart – Gee's experiment:
8. Hall effect:To determine Hall co-efficient of a given semiconductor.
9. LCR Circuit: To determine the resonance frequency and Quality factor of LCR Circuit.
10. R-C Circuit: To determine the time constant of R-C circuit.

Note: Any 8 experiments are to be performed

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2010571: PROGRAMMING FOR PROBLEM SOLVING LAB

I Year B.Tech. DS I – Sem. **L T P C**

0 0 3 1.5

[Note: The programs may be executed using any available Open Source/ Freely available IDE Some of the Tools available are:
CodeLite:https://codelite.org/Code::Blocks:http://www.codeblocks.org/DevCpp:http://www.bloodshed.net/devcpp.htmlEclipse:http://www.eclipse.orgThislistisnotexhaustive and is NOT in any order of preference]

Course Objectives:

- To work with an IDE to create, edit, compile, run and debug programs
- To analyze the various steps in program development.
- To develop programs to solve basic problems by understanding basic concepts in C like operators, control statements etc.
- To develop modular, reusable and readable C Programs using the concepts like functions, arrays etc.
- To create, read from and write to text and binary files

Course Outcomes: At the end of this course, students will be able to

- Formulate the algorithms for simple problems
- Able to develop programs based on condition checking
- Implement pyramid programs
- Able to perform matrix applications
- Modularize the code with functions so that they can be reused
- Create, read and write to and from simple text and binary files

Simple numeric problems:

a. Write a program for the simple, compound interest.
b. Write a program for calculating area, perimeter of a rectangle, triangle and square.
c. Write a program for calculating area and perimeter of a circle.
d. Write a program to implement bit-wise operators.
e. Write a program for converting Fahrenheit to Celsius.
f. Write a simple program that converts one given data type to another using auto conversion and casting. Take the values from standard input.
g. Write a simple program to find largest of two and three numbers using conditional operator.
h. Write a program for swapping two numbers with and without using third variable and using bitwise operators.

Condition branching and statements:

a. Write a program for finding largest of three numbers.
b. Write a program that declares Class awarded for a given percentage of marks, where marks<40%=Failed, 40% to<60% = Second class, 60% to<70%=First class, >=70%=Distinction. Read percentage from standard input.
c. Write a C program to find the roots of a Quadratic equation.

d. Write a C program, which takes two integer operands and one operator from the user, use Switch Statement)

Condition branching and loops:

a. Write a program to find whether the given number is a prime or not.
b. Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome.
c. Write a program that prints a multiplication table for a given number and the number of rows in the table. For example, number=5 and no. of rows = 3, the output should be:
   5x1=5
   5x2=10
   5x3=15
d. Write a program that shows the binary equivalent of a given positive number between0to255.
e. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
f. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
g. WriteaCprogramtocalculatethefollowing,wherexisafractionalvalue.1-x/2+x2/4-x3/6
h. Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:1+x+x2+x3+….+xn. For example: if n=3 and x=5, then the program compute 1+5+25+125.
i. Write a C program to construct a pyramid of numbers as follows:

1	*	1	1	*
12	**	23	22	**
123	***	456	333	***
			4444	**
				*

j. Write a C program to find given number is Armstrong number or not.
k. Write a C program to find given number is Perfect number or not.

Arrays ,Strings, Pointers and Structures:

a. Write a C program to find the minimum, maximum and average in an array of integers.
b. Write a program to compute Mean, Variance, Standard Deviation, Sorting of n elements in single dimension array.
c. Write a C program that perform the following:
   i. Addition of Two Matrices
   ii. Multiplication of Two Matrices
   iii. Transpose of a matrix with memory dynamically allocated for the new matrix as row and column counts may not be same.
d. Write a C program that sorts a given array of names.
e. Write a C program that perform the following operations:
   iv. To insert a sub-string in to a given main string from a given position.
   v. To delete n Characters from a given position in a given string.
f. Write a program for reading elements using pointer into array and display the values using array.
g. Write a program for display values reverse order from array using pointer.
h. Write a program through pointer variable to sum of n elements from array.
i. Write a program to implement student information by using structure to function.
j. Write a program to sort student I do r name using structures.

Functions:

a. Write a C program to find factorial of a given number using functions.

b. Write a C program to perform swapping using functions.
c. Write a C program to find LCM ,GCD of two numbers using functions.
d. Write a C program to implement sorting using functions.
e. Write a C program to create and print two dimensional array using functions.
f. Write a C program to find factorial of a given number using recursion.
g. Write a C program to find Fibonacci series using recursion
h. Write a C program to implement Towers of Hanoi problem using recursion.

Files*:*

a. Write a C program to display the contents of a file to standard output device.
b. Write a C program which copies one file to another, replacing all lower case characters with their upper case equivalents.
c. Write a C program to count the occurrence of a character in a text file. The file name and the character are supplied as command line arguments.
d. Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of these condare put in the third file).

REFERENCES:

1. Byron Gottfried, Schaum"s Outline of Programming with C,McGraw-Hill
2. Let us C by YashavantKanetkar BPB publications (16th Edition)
3. B .A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rdEdition)
4. Brian W. Kernighan and Dennis M.Ritchie, The C Programming Language,Prentice Hall of India
5. R.G. Dromey, How to solve it by Computer, Pearson (16thImpression)
6. Programming in C, Stephen G. Kochan, Fourth Edition, and Pearson Education.
7. Herbert Schildt, C: The Complete Reference, McGrawHill, 4thEdition.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2010074: COMMUNICATIVE ENGLISH LANGUAGE(CEL)LAB

I Year B.Tech. DS I – Sem. **L T P C**

0 0 2 1

Course Objectives:

- Facilitate computer-assisted multi-media instruction enabling individualized and independent language learning.
- Enhance English language skills, communication skills and to practice soft skills.
- Improve fluency and pronunciation intelligibility by providing an opportunity for practice in speaking.
- Train students in different interview and public speaking skills such as JAM, debate, roleplay, group discussion etc.
- Instill confidence and make them competent enough to express fluently and neutralize their mother tongue influence.

Course Outcomes: At the end of this course, students will be able to

- Better perception of nuances of English language through audio- visual experience.
- Neutralization of accent for intelligibility.
- Participate in group activities.
- Speaking skills with clarity and confidence which in turn enhances their employability.
- Apply effective communication skills in a variety of public and interpersonal settings

Communicative English Language Lab(CELL)shall have two parts:

a. Computer Assisted Language Learning(CALL)Lab
b. Interactive Communication Skills(ICS)Lab

Listening Skills Objectives

a. Enable students develop their listening skills to appreciate itsroleinthe LSRW skills approach to language and improve their pronunciation.
b. Equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions.
c. Students should be given practice in listening to the sounds of the language, to be able to recognize them and find the distinction between different sounds, to be able to mark stress and recognize and use the right in to nation in sentences.
    - Listening for general content
    - Listening to fill up information
    - Intensive listening
    - Listening for specific information

Speaking Skills Objectives

a. Involve students in speaking activities in various contexts.
b. Enable students express themselves fluently and appropriately in social and professional contexts.
    - Oral practice: Just A Minute(JAM)Sessions

- Describing objects/situations/people
- Role play–Individual/Group activities
- Group Discussions
- Debate

Exercise–I

CALL Lab: *Understand:* Listening Skill- Its importance – Purpose- Process- Types- Barriers of Listening. *Practice*: Introduction to Phonetics – Speech Sounds – Vowels and Consonants.

ICS Lab: *Understand:* Communication at Work Place –Spoken vs. Written language.

Practice: Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings –Taking Leave–Introducing One self and Others.

Exercise–II

CALL Lab: *Understand:* Structure of Syllables – Word Stress and Rhythm– Weak Forms and Strong Forms in Context. *Practice:* Basic Rules of Word Accent - Stress Shift – Weak Forms and Strong Forms in Context.

ICS Lab: *Understand:* Features of Good Conversation – Non-verbal Communication. *Practice:* Situational Dialogues – Role-Play- Expressions in Various Situations –Making Requests and Seeking Permissions-Telephone Etiquette.

Exercise-III

CALL Lab: *Understand:* Intonation-Errors in Pronunciation-the Influence of Mother Tongue (MTI). *Practice:* Common Indian Variants in Pronunciation –Differences in British and American Pronunciation.

ICS Lab: *Understand:* How to make Formal Presentations. *Practice:* Formal Presentations.

Exercise–IV

CALL Lab: *Understand:* Listening for General Details. *Practice:* Listening Comprehension Tests.

ICS Lab: *Understand:* Public Speaking – Exposure to Structured Talks. *Practice:* Making a Short Speech–Extempore.

Exercise–V

CALL Lab: *Understand:* Listening for Specific Details. *Practice:* Listening Comprehension Tests.

ICS Lab: *Understand:* Interview Skills. *Practice:* Mock Interviews.

Reference Books:

1. Kumar, S. & Lata, P. (2011). Communication Skills. Oxford University Press.
2. Bala subramanian, T. (2008). A Text book of English Phonetics for Indian Students, Macmillan.
3. Thorpe, E. (2006). Winning at Interviews, Pearson Education.
4. Sethi, J. et al. (2005). A Practical Course in English Pronunciation (with CD), Prentice Hall of Effective Technical Communication by M Ashraf Rizvi

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2020002: ENGINEERING MATHEMATICS -II

I Year B.Tech. DS II – Sem.

L	T	P	C
3	1	0	4

Course Objectives:

- Methods of solving the differential equations of 1st and higher order.
- The applications of the differential equations to Newton's law of cooling, Natural growth and decay, etc.
- Concept of Sequence and nature of the series.
- The physical quantities involved in engineering field related to vector valued functions
- The basic properties of vector valued functions and their applications to line, surface and volume integrals.

Course Outcomes: At the end of this course, students will be able to

- **Co 1:** Identify whether the given differential equation of first order is exact or not
- **Co 2**: Solve higher differential equation and apply the concept of differential equation. To real world problems.
- **Co3**: Analyse the nature of sequence and series.
- **Co** 4: Apply the del operator to vector and scalar valued functions.
- **Co 5**: Evaluate the line, surface and volume integrals and converting them from on to Another.

UNIT-I: First Order and First-Degree ODE and its applications

Exact, linear and Bernoulli's equations; Applications: Newton's law of cooling, Law of natural growth and decay. Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut' s type**.**

Learning outcomes:

- Identify whether the given differential equation of first order is exact or not.
- Apply the concept of differential equation to real world problems.
- Understand the conepts of linear and Non linear differential equations.
- Analyze Exact and Non Exact differential equations.
- Explain formation of differential equations, Homogeneous equations

UNIT-II: Higher Order Linear Differential equations

Linear differential equations of second and higher order with constant coefficients, RHS term of the type e^{ax} , Sin ax, Cos ax, and x^n , e^{ax} V(x), x^n V(x), method of variation of parameters; Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Euler equation.

Learning outcomes:

- Identify essential characteristics of linear differential equations with constant coefficients.
- Apply higher order DE's for solving some real world problems.

- Understand the differential equations with constant coefficients by appropriate method.
- Analyse Legendre's equation and Cauchy-Euler equation.
- Explain Method of variation of parameters.

UNIT-III: Sequences & Series

Sequence: Definition of a Sequence, limit; Convergent, Divergent and Oscillatory sequences. Series: Convergent, Divergent and Oscillatory Series; Series of positive terms; Comparison test, p-test, D-Alembert's ratio test; Raabe's test, logarithmic test; Cauchy's Integral test; Cauchy's root test; Alternating series: Leibnitz test; Alternating Convergent series: Absolute and Conditionally Convergence**.**

Learning outcomes:

- Identify the Sequence, types of sequences.
- Apply the concept of sequence and series to real world problems.
- Understand the logical knowledge of forming the series.
- Analyze the nature of sequence and series.
- Explain Alternating series.

UNIT-IV: Vector Differential Calculus

Vector point functions and scalar point functions. Gradient, Divergence and Curl. Directional derivatives. Solenoidal and Irrotational vectors, Scalar potential functions. Vector Identities.

Learning outcomes:

- Identify scalar and vector point functions.
- Apply Del to scalar and vector point functions.
- Understand the concepts of Solenoidal and irrotational vectors.
- Analyze the physical interpretation of Gradient, Divergence and curl.
- Explain vector identies.

UNIT-V: Vector Integral Calculus

Line integral-Work done, Surface Integrals-Flux of a vector valued function and Volume Integrals. Theorems of Green, Gauss and Stokes (without proofs) and their applications.

Learning outcomes:

- Identify the work done in moving a particle along the path over a force field.
- Apply Greens, Stokes and Divergence theorems in evaluation of double and triple integrals.
- Understand the concepts of Line Integral.
- Analyze the Flux of a vector valued function.
- Explain Vector valued theorems to real world problems.

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006

3. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9thEdition, Pearson, Reprint, 2002.

REFERENCES:

1. Paras Ram, Engineering Mathematics, 2nd Edition, CBS Publishes
2. S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2010008: ENGINEERING CHEMISTRY

I Year B.Tech. DS II – Sem.

L	T	P	C
3	1	0	4

Course Objectives:

- To bring adaptability to the concepts of chemistry and to acquire the required skills to become a perfect engineer.
- To impart the basic knowledge of atomic, molecular and electronic modifications which makes the student to understand the technology based on them.
- Toacquiretheknowledgeofelectrochemistry,corrosionandwatertreatmentwhichare essential for the Engineers and in industry
- To acquire the skills pertaining to spectroscopy and to apply them for medical and other fields.
- To impart the knowledge of stereochemistry and synthetic aspects useful for understanding reaction pathways

Course Outcomes: At the end of this course, students will be able to

- The knowledge of atomic, molecular and electronic changes, band theory related to conductivity.
- The required principles and concepts of electrochemistry, corrosion and in understanding the problem of water and its treatments.
- The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.
- The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.

UNIT-I:

Molecular structure and Theory of Bonding: Atomic and Molecular orbitals / Introduction of VBT. Linear Combination of Atomic Orbitals (LCAO), molecular orbitals of diatomic molecules, molecular orbital energy level diagrams of N2, O2 and COmolecules.πmolecularorbitalsof1,3-butadiene.

Crystal Field Theory (CFT): Salient Features of CFT – Crystal Field Splitting of transition metal ion d- orbitalsin tetrahedral, octahedral and square planar geometries. Applications of CFT. Band structure of solids and effect of doping on conductance.

Learning Outcomes: At the end of this unit, the students will be able to

- Understand the Schrodinger wave equation to hydrogen and particle in a box.
- Explain the molecular orbital energy level diagram of different molecular species.
- Applythebandtheoryofsolidsforconductors,semiconductorsandinsulators.
- Analyze discuss the magnetic behavior and colour of complexes.
- Evaluate the Crystal Field theory and Splitting of d-orbital‟s

UNIT-II:

Water and its treatment: Introduction – hardness of water – Causes of hardness - Types of hardness: temporary and permanent – expression and units of hardness – Estimation of hardness

of water by complex metric method, Numerical Problems on hardness of water. Potable water and its specifications. Steps involved in treatment of water – Disinfection of water by chlorination and ozonization. Boiler troubels-scale and sludge,causticembrittlement, priming and foaming. Boiler feed water and its treatment–Calgon conditioning, Phosphate conditioning and colloidal conditioning. External treatment of water – Ion exchange process. Desalination of water – Reverse osmosis.

Learning outcomes: The student will be able to

- Understand the differences between temporary and permanent hardness of water.
- Explain the principles of reverse osmosis and Ion-Exchange processes.
- Apply the drinking water with BIS and WHO standards.
- Analyze problems associated with hardwater –scale and sludge.
- Evaluate the Internal and external treatment of water

UNIT-III:

Electrochemistry and corrosion: Electro chemical cells – electrode potential, standard electrode potential, types of electrodes – calomel, Quinhydrone and glass electrode. Nernst equation Determination of pH of a solution by using glass electrode. Electrochemical series and its applications. Numerical problems. Potentiometric titrations. Batteries – primary (Lithium cell) and secondary batteries (Lead – acid storage battery and Lithium ion battery).

Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affection grate of corrosion, Corrosion control methods-Proper Design, Cathodicprotection– Sacrificial anode and impressed current cathodic methods. Surface coatings – metallic coatings – methods of application. Electroplating and electroless plating of Nickel.

Learning outcomes: The student will be able to

- Understand the Nernst equation for calculating electrode and cell potentials.
- Explain the corrosion prevention methods and factors affecting corrosion.
- Apply the Pilling Bed worth rule for corrosion and corrosion prevention.
- Analyze the Dry and Wet corrosion and its Mechanism.
- Evaluate the Corrosion control methods

UNIT-IV:

Stereochemistry, Reaction Mechanism and synthesis of drug molecules: Introduction to representation of 3-dimensional structures, Structural and stereoisomers, symmetry and chirality. Enantiomers, diastereomers, optical activity and configurational nomenclatures (D,L and R,S configurations) Conformational analysis of n- butane.

Substitution reactions: Nucleophilic substitution reactions: Mechanism of SN1, SN2 reactions. Electrophilic and nucleophilic addition reactions: Addition of HBr to propene. Markownikoff and anti Markownikoff"s additions. Grignard additions on carbonyl compounds. Elimination reactions: Dehydro halogenation of alkylhalides. Saytzeff rule. Oxidation reactions: Oxidation of alcohols using KMnO4.Reduction reactions: reduction ofcarbonyl compoundsusing LiAlH4.Structure, synthesis and pharmaceutical applications of Paracetamol and Aspirin.

Learning Outcomes: At the end of this unit, the students will be able to

- Understand the 3-dimension structures of organic chemistry
- Explain the symmetry, chirality of the organic molecule
- Apply the Mark ownik off and an tiMarkownik off" sadditions; Grignard additions conformations of n-butane
- Analyze the reaction mechanism of different compounds.
- Evaluate the synthesis of a spirin, paracetamol

UNIT-V: Spectro scopic techniques and applications: Principles of spectroscopy, selection rules and applications of electronic spectroscopy and IR Spectroscopy. Basic concepts of Nuclear magnetic resonance Spectroscopy, chemical shift,spin-spin splitting Introduction to Magnetic resonance imaging.

Learning Outcomes: At the end of this unit, the students will be able to

- Understand the. Principles of .spectro scopy and its selection rules
- Explain the concepts of nuclear magnetic resonance spectroscopy
- Apply the chemical shift values for the different compounds
- Analyze the different structures of organic compound
- Evaluate the vibrational and rotational spectroscopy

TEXTBOOKS:

1. Engineering Chemistry by P.C.Jain & M.Jain; Dhanpat Rai Publishing Company (P) Ltd.,NewDelhi.
2. Text Book of Engineering chemistry by Jaya Shree Anireddy: WileyPublications.
3. Text Book of Engineering Chemistry by Prasanth Rath,B.Rama Devi and Ch.Venkata RamanaReddy:CengagePublication2019.

REFERENCES:

1. Organic reaction Mechanism by Morrison and Boyd.
2. Fundamentals of Molecular Spectroscopy by C.N.Banwell
3. Inorganic Chemistry byJ.D.Lee

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2020502: DATA STRUCTURES

I Year B.Tech. DS II – Sem.	L	T	P	C
	3	0	0	3

Prerequisites: A course on "Programming for Problem Solving "

Course Objectives:

- Exploring basic data structures such as linked list, stacks and queues.
- Describes searching and sorting techniques.
- Introduces trees and graphs.

Course Outcomes: At the end of this course, students will be able to

- Ability to select the data structures that efficiently model the information in a problem.
- Ability to assess efficiency trade-offs among different data structure implementations or combinations.
- Implement and know the application of algorithms for searching and sorting.
- Design programs using a variety of data structures- lists, stacks, queues, trees and graphs.

UNIT-I:

Introduction to Data Structures, Linear list – singly linked list, Doubly linked list, Circular linked list - operations and its applications.

UNIT-II

Stacks- Introduction, Operations, array and linked representations of stacks, stack applications (Infix to postfix conversion and postfix evaluation), Queues-Introduction, operations, array and linked representations of queues and its applications.

UNIT - III

Searching: Linear Search and Binary Search and its applications.

Sorting: Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort and its applications**.**

UNIT-IV

Trees - Introduction, Types of trees, Binary tree, recursive and non- recursive Traversals of Binary Tree, Binary search tree- Operations and its applications.

UNIT - V

Graphs: Introduction, Types of graphs, Representation of graphs, Graph Traversal Methods, comparison between trees and graphs and its applications.

TEXT BOOKS:

1. Fundamentals of data structures in C, E.Horowitz, S.Sahni and Susan Anderson Freed, 2nd Edition, Universities Press.
2. Data structures using C, A.S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/pearson education.

REFERENCES:

1. Data structures: A Pseudocode Approach with C, R.F.GilbergAndB.A.Forouzan, 2nd Edition, Cengage Learning.
2. Introduction to data structures in C, Ashok Kamthane, 1st Edition, PEARSON.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2020009:ENGINEERING DRAWING PRACTICE

I Year B.Tech. DS II – Sem.

L	T	P	C
1	0	4	3

Prerequisites: Knowledge in dimensions and units, Usage of geometrical instruments and analytical ability.

Course Objectives:

- The course is aimed at developing basic graphic skills so as to enable them to use these skills in preparation of engineering drawings, their reading and interpretation.
- To prepare the student to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- To get exposure to a CAD package

Course Outcomes: At the end of this course, students will be able to

- Familiarize with BIS standards and conventions used in engineering graphics.
- Draw various engineering curves e.g., ellipse, parabola, cycloids and involutes etc and construct various reduced scales e.g., plain and diagonal scale.
- Develop the lateral surfaces of simple solids
- Ability to draw orthographic projections and isometric projections of given engineering components.
- Visualize different views like elevation and plan for a given line, plane figures or solid objects.
- Apply drafting techniques and use 2D software e.g., AutoCAD to sketch 2D plane figures.

UNIT – I: INTRODUCTION TO ENGINEERING DRAWING

Principles of Engineering Graphics and their Significance-Drawing Instruments and their Uses-Conventions in Drawing-BIS -Lettering and Dimensioning.

Geometrical Constructions: Bisecting a Line, Arc. Dividing A Line into 'N' Equal Parts, Construction of Polygons, Division of Circle into Equal Parts (8 And 12)

Construction of Scales: Plain, Diagonal and Vernier Scale.

Conic Sections: Ellipse, Parabola, Hyperbola and Rectangular Hyperbola- General Methods only.

Engineering Curves: Cycloid, Epicycloid, Hypocycloid

Involutes: For Circle, Triangle, Square, Pentagon and Hexagon.

Learning Outcome:

- To understand the basic standards, conventions of engineering drawing and how to use the instruments in drawing.
- Learn and draw the various types of curves used in engineering application.

UNIT – 2: ORTHOGRAPHIC PROJECTIONS

Principles - Assumptions- Different Angles of Projection.

Projections of Points- orientation in all the quadrants

Projections of Lines- Parallel, Perpendicular, Inclined to one plane and Inclined to both planes.

Projections of Planes: Surface Parallel, Perpendicular, Inclined to one plane and Inclined to both planes.

Learning Outcome:

- Knowledge in various planes of projections
- To draw the front view, top view and side views of the given geometrical elements

UNIT – 3 PROJECTIONS OF SOLIDS

Classification of solids- Axis- Parallel, Perpendicular, Inclined to one plane and Inclined to both planes- Prisms, Pyramids, Cylinder and Cone

Learning Outcome:

- To understand the various solid types
- To draw all the views of the given solid in all possible orientations.

UNIT – 4 SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES

Types of Section Planes, Sectioning Prisms, Pyramids, Cylinders and Cones using various planes. Development of surfaces of right Regular Solids- Parallel Line Method, Radial Line Method.

Learning Outcome:

- To identify the cut surfaces and represent the sectional views graphically when the solid is sectioned.
- To develop the surfaces of solid using various methods.

UNIT – 5 ISOMETRIC PROJECTIONS AND PERSPECTIVE PROJECTIONS

Principles, Isometric Views of Planes, Solids- Box Method, Offset Method, Compound solids, Sectioned Solids. Conversion of Isometric to Multi view projection and vice versa.

Learning Outcome:

- Knowledge in principles of isometric projection
- Conversion of isometric to orthographic and vice-versa.

TEXT BOOKS:

1. N.D.Bhatt, Elementary Engineering Drawing, Charotar Publishers,2012.
2. Basanth Agrawal and C M Agrawal –Engineering Drawing 2e –,McGraw-Hill Education(India) Pvt.Ltd.

REFERENCES:

1. Engineering graphics with Auto CAD- R.B. Choudary/ Anuradha Publishers
2. Engineering Drawing- Johle/Tata Macgraw Hill.
3. K.Veenugopal, –Engineering Drawing and Graphics + Auto cad New Age International Pvt.Ltd, 2011

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AUTONOMOUS)

2010073 : ENGINEERING CHEMISTRY LAB

I Year B.Tech. DS II – Sem.

L	T	P	C
0	0	3	1.5

Course Objectives:

- Estimation of hardness and chloride content in water to check its suitability for drinking purpose.
- To determine the rate constant of reactions from concentrations as an function of time.
- The measurement of physical properties like adsorption and viscosity.
- To synthesize the drug molecules and check the purity of organic molecules by thin layer chromatographic (TLC) technique.

Course Outcomes: At the end of this course, students will be able to

- Understand various procedures for performing the experiments.
- Explain the different measuring devices and meters to record the data
- Apply the mathematical concepts and equations to obtain quality results.
- Analyze the analytical techniques and graphical analysis to the experimental data.
- Evaluate the various parameters for different experiments accurately.

List of Experiments:

1. Determination of total hardness of water by complex metric method using EDTA
2. Determination of chloride content of water by Argento metry

Conducto metric titrations

3. Strong acid Vs Strong Base
4. Weak acid Vs Strong Base

Potentio etricitrations

5. Strong acid vs strong base
6. Redoxtitration:-Fe^{2+}usingKMnO4
7. Determination of rate constant of acid catalysed hydrolysis of methy lacetate
8. Synthesis of Aspirin and Paracetamol
9. Thin layer chromatography-calculation of R f values. eg:ortho and paranitrophenols
10. Determination of acid value of coconut oil
11. Determination of viscosity of castor oil and ground nut oil by using Ostwald "svis cometer.
12. Determination of surface tension of a give liquid using stalagnometer

REFERENCES:

1. Senior practical physical chemistry, B.D. Khosla, A. Gulatiand V.Garg (R. Chand & Co.,Delhi)
2. An introduction to practical chemistry, K.K. Sharma and D.S.Sharma (Vikas publishing, N.Delhi)
3. Vogel"stextbookofpracticalorganicchemistry5thedition
4. Text book on Experiments and calculations in Engineering chemistry–S.S.Dara

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2020572: DATA STRUCTURES LAB

I Year B.Tech. DS II – Sem.

L	T	P	C
0	0	2	1

Prerequisites: A Course on "Programming for problem solving".

Course Objectives:

- It covers various concepts of C programming language
- It introduces searching and sorting algorithms
- It provides an understanding of data structures such as stacks and queues.

Course Outcomes:

- Ability to develop C programs for computing and real life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.
- Ability to Implement searching and sorting algorithms

List of Experiments

1. Write a program that uses functions to perform the following operations on singly linked list.: i) Creation ii) Insertion iii) Deletion iv) Traversal
2. Write a program that uses functions to perform the following operations on doubly linked list.: i) Creation ii) Insertion iii) Deletion
3. Write a program that uses functions to perform the following operations on circular linked list: i) Creation ii) Insertion iii) Deletion
4. Write a program that implement stack operations using i) Arrays ii) Pointers
5. Write a c program to implement infix to postfix conversion using stack.
6. Write a c program to implement postfix evaluation.
7. Write a program that implement Queue operations using i) Arrays ii) Pointers
8. Write a program that implements the following sorting methods to sort a given list of integers in ascending order i) Bubble sort ii) Selection sort iii) Insertion sort
9. Write a program that implements the following sorting methods to sort a given list of integers in ascending order i) Merge sort ii) Quick sort
10. Write a program that use both recursive and non-recursive functions to perform the following searching operations for a Key value in a given list of integers: i) Linear search ii) Binary search

11. Write a program to implement the tree traversal methods using both recursive and non-recursive.

12. Write a program to implement the graph traversal methods.

TEXT BOOKS:

1. Fundamentals of data structures in C, E.Horowitz, S.Sahni and Susan Anderson Freed, 2nd Edition, Universities Press.
2. Data structures using C, A.S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/pearson education.

REFERENCES:

1. Data structures: A Pseudocode Approach with C, R.F.GilbergAndB.A.Forouzan, 2nd Edition, Cengage Learning.
2. Introduction to data structures in C, Ashok Kamthane, 1st Edition, PEARSON.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2010372 : ENGINEERING WORKSHOP

I Year B.Tech. DS II – Sem.

L	T	P	C
1	0	3	2.5

Course Objectives:

- To Study of different hand operated power tools, uses and their demonstration.
- To gain a good basic working knowledge required for the production of various engineering products.
- To provide hands on experience about use of different engineering materials, tools, equipment and processes those are common in the engineering field.
- To develop a right attitude, team working, precision and safety at work place.
- It explains the construction, function, use and application of different working tools, Equipment and machines

Course Outcomes: At the end of this course, students will be able to

- Explain the design and model different prototypes in the carpentry trade such as Cross lap joint, Dove tail joint. (L4)
- Demonstrate the design and model various basic prototypes in the trade of fitting such as Straight fit, V- fit. (L4)
- Understand to make various basic prototypes in the trade of Tin smithy such as rectangular tray, and open Cylinder. (L4)
- Demonstrate the design and model various basic prototypes in the trade of Welding. (L4)
- Explain to make various basic prototypes in the trade of Black smithy such as J shape, and S shape. (L4)
- Understand to perform various basic House Wiring techniques such as connecting one lamp with one switch, connecting two lamps with one switch, connecting a fluorescent tube, Series wiring, Go down wiring. (L4)

UNIT-I: CARPENTRY & FITTING

Carpentry – Introduction, Carpentry tools, sequence of operations, Trade importance, advantages, disadvantages and applications

Fitting – Introduction, fitting tools, sequence of operations, Trade importance, advantages, disadvantages and applications

UNIT-II: TIN SMITHY AND BLACKSMITHY

Tin-Smithy – Introduction, Tin smithy tools, sequence of operations, Trade importance, advantages, disadvantages and applications

Black smithy- Introduction, Black smithy tools, sequence of operations, Trade importance, advantages, disadvantages and applications

UNIT-III: **HOUSE WIRING AND WELDING**

House-wiring – Introduction, Electrical wiring tools, sequence of operations and applications (Parallel & Series, Two-way Switch and Tube Light)

Welding Practice – Introduction, electrode, welding tools, and sequence of operations,

advantages and applications (Arc Welding & Gas Welding).

LIST OF EXPERIMENTS:

1. Carpentry
2. Fitting
3. House Wiring
4. Tin smithy
5. Black smithy
6. welding
7. Foundry

TRADES FOR DEMONSTRATION & EXPOSURE:

1. Plumbing
2. Metal Cutting (Water Plasma), PowerTools In Construction And
3. Wood Working

TEXTBOOKS:

1. Workshop Practice /B. L. Juneja / Cengage
2. Workshop Manual / K. Venugopal / Anuradha

REFERENCES:

1. Work shop Manual – P. Kannaiah/ K. L. Narayana/ SciTech
2. Workshop Manual / Venkat Reddy/ BSP

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2010021: ENVIRONMENTAL SCIENCE

I Year B.Tech. DS II – Sem.	**L**	**T**	**P**	**C**
	2	**0**	**0**	**0**

Course Objectives:

- Understanding the importance of ecological balance for sustainable development.
- Understanding the impacts of developmental activities and mitigation measures.
- Understanding the environmental policies and regulations
- Understanding the importance of natural resources
- Understanding the different standards of environmental pollution

Course Outcomes: At the end of this course, students will be able to

- Understand the technologies on the basis of ecological principles
- Apply the environmental regulations which in turn helps in sustainable development.
- Understand the various classifications of ecosystems and natural resources.
- Apply environmental regulations to different acts.
- Evaluate the values of social, ethical and aesthetic

UNIT-I:

Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnifications, Field visits.

Learning Outcomes:

- Understand the importance of eco system.
- Explain the various classifications.
- Apply to different cycles.
- Analyse the importance field visit.
- Evaluate the flow of energy

UNIT-II:

Natural Resources: Classification of Resources: Living and Non-Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, **Dams**: benefits and problems. **Mineral resources:** use and exploitation, environmental effects of extracting and using mineral resources, **Land resources**: Forest resources, Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.

Learning Outcomes:

- Understand the importance of natural resources.
- Explain the various classifications of natural resources.
- Apply to different renewable resources.
- Analyse the usage of resources.
- Evaluate the value of renewable and non renewable energy sources

UNIT-III:

Biodiversity And Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

Learning Outcomes:

- Understand the importance of Bio diversity.
- Explain the types of Biodiversity.
- Apply to different Biotic Resources.
- Analyse the importance Bio diversity And Biotic Resources.
- Evaluate the values of social, ethical and a esthetic

UNIT-IV:

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, Air Pollution: Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. Water pollution: Sources and types of pollution, drinking water quality standards. **Soil Pollution**: Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management**. Pollution control technologies**: Wastewater Treatment methods: Primary, secondary and Tertiary. Overview of air pollution control technologies, Concepts of bioremediation. **Global Environmental Issues and Global Efforts**: Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol, and Montréal Protocol. NAPCC-GoI Initiatives.

Learning Outcomes:

- Understand the importance of Pollution and control technologies.
- Explain the classifications of pollutions.
- Apply to environment.
- Analyse the importance waste management.
- Evaluate the value of Ozone depletion and Ozone depleting substances

UNIT-V:

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act-1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. **EIA:** EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Concepts of Environmental Management Plan (EMP). Towards Sustainable Future: Concept of Sustainable Development Goals, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building.

Learning Outcomes:

- Understand the importance of Environmental Policy, Legislation.
- Explain the various acts.
- Apply to different Environmental Management Plan.
- Analyse the importance of environmental education.
- Evaluate the value of green building.

TEXTBOOKS:

1. Text book of Environmental Studies for Under graduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies by R. Raja gopalan, Oxford University Press.

REFERENCES:

1. Environmental Science: towards as stainable future by Richard T.Wright .2008 PHL Learning Private Ltd.New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela.2008PHILearningPvt.Ltd.
3. Environmental Studies by Anubha Kaushik, 4thEdition, New age international publishers.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2030503: DATABASE MANAGEMENT SYSTEMS

II Year B.Tech. DS I – Sem.

L	T	P	C
3	0	0	3

Prerequisites: A Course on "Data Structure and Linear Algebra".

Course Objectives:

- To understand the basic concepts and the applications of database systems.
- To master the basics of SQL and construct queries using SQL.
- Topics include data models ,data base design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.

Course Outcomes:

- Gain knowledge of fundamentals of DBMS, data base design and normal forms
- Master the basics of SQL for retrieval and management of data.
- Be acquainted with the basics of transaction processing and concurrency control.
- Familiarity with database storage structures and access techniques.

UNIT-I

Database Systems: A Historical Perspective, File Systems versus a DBMS, Relational Model, Levels of Abstraction in a DBMS, Data Independence, Structure of DBMS.

Introduction to Database Design: Database Design and ER Diagrams, Entities, Attributes, and Entity Sets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design With ER Model.

UNIT-II

Relational Model: Introduction, Integrity constraints over relations, Enforcing integrity constraints, querying relational data, logical database design, introduction to views, destroying/altering tables and views.

Relational Algebra and Calculus: Relational Algebra, Tuple relational Calculus, Domain relational calculus.

UNIT-III

SQL: Queries, Constraints, Triggers: Form of basic SQL query, UNION, INTERSECT, and EXCEPT, Nested Queries, aggregation operators, NULL values, complex integrity constraints in SQL, triggers and active data bases.

Schema refinement: Problems caused by redundancy, Decompositions, problems related to decomposition, Reasoning about Functional Dependencies, FIRST, SECOND, THIRD normal forms, BCNF, Loss less join decomposition, Multi-valued dependencies, FOURTH normal form, FIFTH normal form.

UNIT-IV

Transaction Management: ACID properties, Transactions and Schedules, Concurrent execution of transactions, Lock-based Concurrency control, Performance of locking, Transaction support in

SQL, Introduction to crash recovery.

Concurrency control: Serializability and Recoverability, Introduction to lock management, Lock conversions, Dealing with dead locks, Spealized locking techniques, Concurrency control without locking.

UNIT– V

Storage and Indexing: Data on External Storage, File Organization and Indexing, Cluster Indexes, Primary and Secondary Indexes, Index data Structures, Hash Based Indexing, Tree base Indexing, Comparison of File Organizations, Indexes and Performance Tuning

Tree structured Indexing: Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM), B+Trees: A Dynamic Index Structure.

TEXT BOOKS:

1. DatabaseManagementSystems,RaghuRamakrishanan,JohannesGehrke,TataMcGraw Hill 3rd Edition
2. Database System Concepts, Silberschatz, Korth, McGrawhill, Vthedition.

REFERENCE:

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel, 7th Edition.
2. SQL The Complete Reference, James R.Groff, Paul N. Weinberg, 3rdEdition,
3. Oracle for Professionals, The X Team,S.Shah and V. Shah, SPD.
4. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah ,PHI

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2030510:OPERATING SYSTEMS

III Year B.Tech. DS I – Sem.

L	T	P	C
3	0	0	3

Prerequisites:

- A course on “Programming for Problem Solving”.
- A course on “Computer Organization and Architecture

Course Objectives:

- Provide an in introduction to operating system concepts (i.e., processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection)
- Introduce the issues to be considered in the design and development of operating system
- Introduce basic Unix commands, system call interface for process management, interposes communication and I/O in Unix

Course Outcomes: The students should be able to

- Control access to a computer and the files that may be shared.
- Demonstrate the knowledge of the components of computer and their respective roles in computing.
- Recognize and resolve user problems with standard operating environments.
- Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.

UNIT-I

Operating System Introduction: What is an operating system do, computer system organization, computer system architecture, operating system structure- operating system operations, process management, memory management, operating system services, System Calls, types of system calls.

UNIT-II

Process :.-process concepts, process scheduling, operations on processes ,Inter processes communication, multithreading models, thread libraries.

Process Scheduling:-Scheduling criteria, scheduling algorithms, thread scheduling Multiple-Processor Scheduling.

UNIT–III

Deadlocks - System Model, Deadlocks Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock.

Synchronization: - back ground, the critical section problem, peter’s solution, Synchronization hardware, semaphores, Classical Problems of Synchronization, Monitors.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AUTONOMOUS)

UNIT–IV

Memory Management and Virtual Memory –background, Swapping, Contiguous Allocation, Paging structure of the page table, Segmentation.

Virtual memory:-background, demand paging page replacement allocation of frames thrashing.

UNIT-V

File System : –File system and implementing file system, file concept access methods, directory and file system structure, File system implementation, Directory implementation, Allocation methods, Free-space Management, efficiency and performance, recovery, NFS.

TEXT BOOKS:

1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley
2. Advanced programming in the Unix environment, W.R. Stevens, Pearson education.

REFERENCES:

1. Operating Systems – Internals and Design Principles, Stallings, 5th Edition, Pearson Education/PHI,2005.
2. Operating System A Design Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum 2nd edition, Pearson/PHI
4. Unix programming environment, Kernighan and Pike, PHI. / Pearson Education
5. Unix Internals The New Frontiers, U.Vahalia, Pearson Education

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2036201:DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION

III Year B.Tech. DS I – Sem.

L	T	P	C
3	1	0	4

Prerequisites: NIL

Course Objectives:

- To express real life problem in logic design terminology.
- To use Boolean algebraic formulations to design digital systems. To design using combinational/sequential circuits
- To understand the concepts of memory units
- To explain the functions of the various I/O .
-

Course Outcomes: The students should be able to

- Understand logic gates and binary codes.
- Design the sequential and combinational circuits.
- Understand computer arithmetic and addressing modes
- Understand and apply the concepts of memory units and I/O

UNIT- I

Basic Structure of Computers: Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Historical perspective.

Digital Systems and Binary Numbers:- Complements, Signed binary numbers, Binary codes, Binary storage and registers, binary logic.

Boolean algebra and logic gates, gate level minimization basic definitions axiomatic of Boolean algebra, basic thermos, canonical and standard forms, the map methods four variable map, five variable map.

UNIT- II

Combinational logic: - combination circuits, binary adder substracter decimal adder binary multiplier, Magnetic compotator, decoders, encoders, multiplexers.

Synchronous Sequential Logic: Sequential circuits, latches, Flip-Flops, Analysis of clocked sequentialcircuits, State Reduction and Assignment, Design Procedure.

Registers and Counters: Registers, shift Registers, Ripple counters, synchronous counters.

UNIT- III

Arithmetic: Addition and subtraction of signed numbers, Design of fast adder, Multiplication of positive Numbers, signed operand multiplication, fast multiplication, integer division, floating point numbers.

Machine Instruction and Programs: Memory Locations and Addresses, Memory operations, instructions and instruction sequencing, Addressing Modes

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

UNIT- IV

Basic Processing Unit: Multiple Bus Organization, Hardwired Control, Micro programmed Control **Memory Systems**: Concept of Memory, RAM, ROM memories, cache memories, virtual memory, secondary storage, memory management requirements.

UNIT- IV

Input / Output Organization: Introduction to I/O, Interrupts- Hardware, Enabling and disabling Interrupts, Device Control, Direct memory access, buses, interface circuits, standard I/O Interfaces.

TEXT BOOKS:

1. Computer Organization -Carl Hamacher, ZvonkoVranesic, SafwatZaky, fifth edition, McGraw Hill.
2. Digital Design – Fourth Edition , M.Morris Mano, Pearson Education/PHI

REFERENCES:

1. Computer Architecture and Organization- An Integrated Approach, Miles Murdocca, Vincent Heuring, Second Edition, Wiley India.
2. Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson.
3. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson
4. Computer- organization and Design- David A. Paterson and John L.Hennessy- Elsevier.
5. Fundamentals or Computer Organization and Design, - SivaramaDandamudi Springer Int. Edition.
6. Digital Design – Third Edition, M.Morris Mano, Pearson Education/PHI.
7. Fundamentals of Logic Design, Roth, 5th Edition, Thomson.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2030004 :PROBABILITY AND STATISTICS

II Year B.Tech. DS I – Sem.

L	T	P	C
3	0	0	3

Prerequisites: NIL

Course Objectives:

- The ideas of probability and random variables and various discrete and continuous probability distributions and their properties.
- The basic ideas of statistics including measures of central tendency.
- The statistical methods of studying data samples.
- The sampling theory and testing of hypothesis and making inferences.

Course Outcomes: After learning the contents of this paper the student must be able to

- Formulate and solve problems involving random variables and apply statistical methods for analysing experimental data.
- Apply discrete and continuous probability distributions.
- Classify the concepts of data science and its importance.
- Infer the statistical inferential methods based on small and large sampling tests.
- Interpret the association of characteristics through correlation and regression tools.

UNIT-I: Probability and Random Variables

Probability: Sample Space, Events, Probability of an Event, Additive Rules, conditional probability, independent events, Product Rule and Bayes„ theorem.

Random variables: Discrete and continuous random variables. Expectation, Mean and Variance of random variables. Chebyshev„s inequality.

UNIT-II: Probability Distributions & Estimation

Probability distribution-Binomial, Poisson approximation to the binomial distribution, uniform, exponential and Normal distribution. Estimation.: Estimating the Mean, Standard Error of a Point Estimate, Prediction Intervals, Tolerance Limits, Estimating the Variance, Estimating a Proportion for single mean, Difference between Two Means, between Two Proportions for Two Samples and Maximum Likelihood Estimation.

UNIT-III: Sampling theory and Small samples

Population and sample, parameters and statistics; sampling distribution of means (⌐ known)- central limit theorem, t-distribution, sampling distribution of means (⌐ unknown)- sampling distribution of variances-chi-square and F-distributions.

UNIT-IV: Testing of Hypothesis & Stochastic Process:

Testing of Hypothesis: Large sample test for single proportion, difference of proportions, single mean, difference of means.

Stochastic process: Introduction to Stochastic processes- Markov process. Transition Probability, Transition Probability Matrix, First order and Higher order Markov process, n- step

transition probabilities, Markov chain, Steady state condition, Markov analysis.

UNIT-V: Curve Fitting for Statistical Data

Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves; Correlation and regression – Rank correlation.

TEXTBOOKS:

1. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, keying Ye, Probability and statistics for engineers and scientists, 9th Edition, Pearson Publications.
2. Fundamentals of Mathematical Statistics, Khanna Publications, S C Guptas and V.K. Kapoor.

REFERENCE:

1. Miller and Freund„s, Probability and Statistics for Engineers, 8th Edition, Pearson Educations S. Ross, A First Course in Probability, 6th Ed., Pearson Education India,2002

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2030505:PYTHON PROGRAMMING

II Year B.Tech. DS I – Sem.

L	T	P	C
3	0	0	3

Prerequisites: NIL

Course Objectives:

- Handle Strings and Files in Python.
- Understand Lists, Dictionaries and Regular expressions in Python.
- Understand FILES, Multithread programming in Python.
- Understand GUI in Python.

Course Outcomes:

- Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
- Demonstrate proficiency in handling Strings and File Systems.
- Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries.
- Develop programs using graphical user interface.

UNIT-I

Python Basics

Python Objects: Standard Types, Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types.

Python Numbers: Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions.

UNIT-II

Conditionals and Loops-if, else, elif, for, while, break, continue, pass, List comprehensions, Generator expressions.

Sequences: Strings, Lists, and Tuples -Built-in Functions, Special features.

Mapping and Set Types: Dictionaries, Sets-Built-in Functions.

UNIT-III

Files and Input / Output: File Objects, File Built-in Functions, File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage Modules, Related Modules.

Exceptions:ExceptionsinPython,DetectingandHandlingExceptions,ContextManagement,ExceptionsasStrings,RaisingExceptions,Assertions,StandardExceptions,CreatingExceptions,Exceptionsand the sys Module.

UNIT-IV

Functions and Functional Programming–Calling Functions , Creating Functions, Passing Functions,

Formal Arguments, Variable- Length Arguments, Functional Programming.

Modules –Modules and Files, Name spaces, Importing Modules, Module Built-in Functions, Packages, Related modules.

UNIT– V

Multithreaded Programming: Introduction, Threads and Processes, Python Threads, the Global Interpreter Lock, Thread Module, Threading Module.

GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs.

TEXT BOOKS:

1. Core Python Programming, WesleyJ. Chun, SecondEdition, Pearson.

REFERENCES:

1. Think Python, Allen Downey, Green Tea Press
2. Introduction to Python, Kenneth A. Lambert, Cengage
3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
4. Learning Python, Mark Lutz, O" Really.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2030579-OPERATING SYSTEMS LAB (Using UNIX/LINUX)

II Year B.Tech. DS I – Sem.

L	T	P	C
0	0	3	1.5

Prerequisites: A Course on Data Structures

Course Objectives:

- To provide an understanding of the design aspects of operating system concepts through simulation.
- Introduce basic Unix commands, system call interface for process management, inter process communication and I/O in Unix

Course Outcomes: After learning the contents of this paper the student must be able to

- Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.
- Able to implement C programs using Unix system calls

List of Experiments

1. Write C programs to simulate the following CPU Scheduling algorithms
   a) FCFS b)SJF c)Round Robin d) priority
2. Write programs using the I/O system calls of UNIX/LINUX operatingsystem (open, read, write, close, fcntl, seek, stat, opendir, readdir)
3. Write a C program to simulate Bankers Algorithm for Deadlock Avoidance and Prevention.
4. Write a C program to implement the Producer – Consumer problem using semaphoresusing UNIX/LINUX system calls.
5. Write C programs to illustrate the following IPC mechanisms
   a) Pipes b)FIFOs c)Message Queues d) Shared Memory
6. Write C programs to simulate the following memory management techniques
   a) Paging b)Segmentation

TEXT BOOKS:

1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley
2. Advanced programming in the Unix environment, W.R.Stevens, Pearson education.

REFERENCES:

1. Operating Systems – Internals and Design Principles Stallings, Fifth Edition–2005, Pearson Education/PHI
2. Operating System A Design Approach-Crowley,TMH.
3. Modern Operating Systems, Andrew S Tanenbaum 2nd edition, Pearson/PHI
4. Unix programming environment, Kernighan and Pike, PHI. / Pearson Education
5. Unix Internals The New Frontiers, U.Vahalia, Pearson Education

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AUTONOMOUS)

2030573: DATABASE MANAGEMENT SYSTEMS LAB

II Year B.Tech. DS I – Sem.

L	T	P	C
0	0	3	1.5

Prerequisites: A Course on Data Structures

Course Objectives:

- Introduce ER data model, database design and normalization
- Learn SQL basics for data definition and data manipulation

Course Outcomes: After learning the contents of this paper the student must be able to

- Understand and explore the basics of computer networks and various protocols.
- Design database schema for a given application and apply normalization
- Acquire skills in using SQL commands for data definition and data manipulation.
- Develop solutions for database applications using procedures, cursors and triggers.

Problem statement

"Roadway Travels" is in business since 1997 with several buses connecting different places in india. Its main office is located in Hydarabad.

The company wants to computerize its operations in the following areas:

- Reservation and Ticketing
- Cancellations

Reservation & Cancellation:

Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One Passenger/person can book many tickets (to his/her family).

Cancellations are also directly handed at the booking office.

In the process of computerization of Roadway Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from database.

The above process involves many steps like

1. Analyzing the problem and identifying the Entities and Relationships,
2. E-R Model
3. Relational Model
4. Normalization
5. Creating the database
6. Querying.

Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels. Examples are given at every experiment for guidance to students.

Experiment 1: E-R Model

Analyze the carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc.

Identify the primary keys for all the entities. Identify the others keys like candidate keys, partial keys, if any.

Example: Entities:

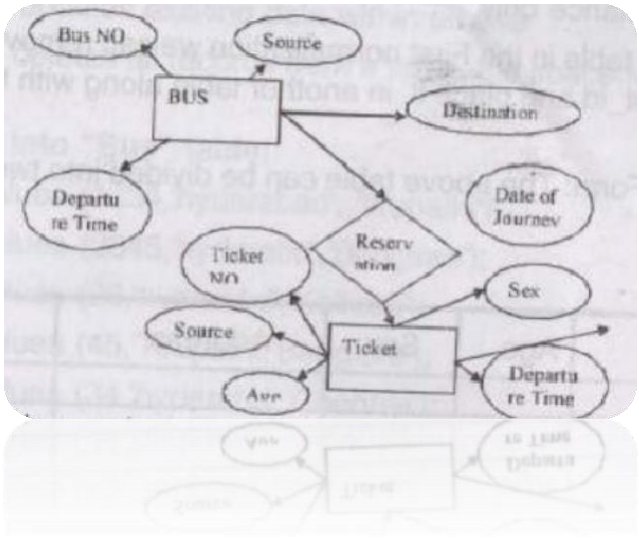
1. BUS
2. Ticket
3. Passenger

Relationships:

1. Reservation
2. Cancellation

PRIMARY KEY ATTRIBUTES:
Ticket ID (Ticket Entity)
Passport ID (Passenger Entity)
Bus_No (Bus Entity)
A part from the above mentioned entities you can identify more. The above mentioned are few.
Note: The students is required to submit a document by writing the Entities and keys to the lab teacher.

Experiment 2: Concept design with E-R Model
Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total / partial). Try to incorporate generalization, aggregation, specialization etc wherever required.
Example: E-R diagram for bus



Note: The students is required to submit a document by drawing the E-R Diagram.

Experiment 3: Relational Model
Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the requirement. Different types of attributes (Composite, Multi-valued, and Derived) have different way of representation.
Example: The passenger tables look as below. This is an example. You can add more attributes

based on E-R model. This is not a normalized table.

Passenger

Name			Address	Ticket_id	Passport ID

Note: The students is required to submit a document by Represent relationships in a tabular fashion to the lab teacher.

Experiment 4: Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

For the above table in the First normalization we can remove the multiple valued attribute Ticket_id and place it in another table along with the primary key of passenger.

First Normal Form: The above table can divided into two tables as shown below. Passenger

Name	Age	Sex	Address	Passport ID

Passport ID	Ticket_id

You can do the second and third normal forms if required. Any how Normalized tables are given at the end.

Experiment 5: Installation of MySQL and practice DDL commands

Installation of MySQL. In this week you will learn Creating databases, How to create tables, altering the database, droping tables and databases if not required. You will also try truncate, rename commands etc.

Example for creation of a normalized "Passenger" table. CREATE TABLE Passenger(
Passport_id INTEGER PRIMARY KEY, Name VARCHAR(50) NOT NULL, Age INTEGER NOT NULL,Sex CHAR,Address VARCHAR(50) NOT NULL);

Similarly create all other tables.

Note: Detailed creation of tables is given at the end.

Experiment 6: Practicing DML commands

DML commandsare used for managing data within schema objects. Some examples:

SELECT - retrieve data from the database
INSERT - insert data into a table

UPDATE - updates existing data within a table
DELETE - deletes all records from a table, the space for the records remain
insert values into "Bus" table:
insert into Bus values (1234, 'hyderabad', 'tirupathi');

insert values into "Passenger" table:
insert into Passenger values(1, 45, 'ramesh', 45, 'M', 'abc123'); insert into Passenger values(56, 22, 'seetha', 32, 'F', 'abc55');

Few more Examples of DML commands:
SELECT * FROM Bus; (selects all the attributes and displays) UPDATE Bus SET Bus_No = 1 WHERE Bus_No = 2;

Experiment 7: Querying

In this week you are going to practice queries(along with sub queries) using ANY, ALL, IN, EXISTS, NOT EXIST, UNION, INTERSECT, Constraints etc.

Practice the following Queries:

Display unique PNR_No of all passengers.
Display all the names of male passengers.
Display the ticket numbers and names of all the passengers.
Find the ticket numbers of the passengers whose name start with 'r' and ends with 'h'.
Find the names of passengers whose age is between 30 and 45.
Display all the passengers names beginning with 'A'
Display the sorted list of passengers names.

Experiment 8 and Experiment 9: Querying (continued...)

You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, MAX,and MIN), GROUP BY, HAVING and Creation and dropping of VIEWS.
Write a Query to display the information present in the Passenger and cancellation tables. Hint: Use UNION Operator.
Display the number of days in a week on which the 9W01 bus is available.
Find number of tickets booked for each PNR_No using GROUP BY CLAUSE. Hint: Use GROUP BY on PNR_No.
Find the distinct PNR numbers that are present.
Find the number of tickets booked by a passenger where the number of seats is greater than 1. Hint: Use GROUP BY, WHERE and HAVING CLAUSES.
Find the total number of cancelled seats.

Experiment 10: Triggers

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.
E.g:

```
CREATE TRIGGER updatecheck BEFORE UPDATE ON passenger FOR EACH ROW BEGIN
IF NEW.TickentNO> 60 THEN
SET New.TickentNO = TicketNo; ELSE
SET New.TicketNo = 0; END IF;
END
```

Experiment 11; Procedures

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the database.

E.g:

```
CREATE PROCEDURE myproc() BEGIN
SELECT COUNT(Tickets) FROM Ticket
WHERE age >= 40; END;
```

Experiment 12: Cursors

In this week you need to do the following: Declare a cursor that defines a result set.

Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done

```
CREATE PROCEDURE myproc(in_customer_id INT) BEGIN
DECLARE v_id INT;
DECLARE v_nameVARCHAR(30);

DECLARE c1 CURSOR FOR
SELECT stdid, stdFirstname FROM studentsss WHERE stdid - in_customer_id;

OPEN c1;
FETCH c1 INTO v_id, v_name; CLOSE c1;
END;
```

Tables:

BUS

Bus No: VARCAHR : PK(primary key) Source: VARCHAR

Destination: VARCHAR

Passenger

PPNO: VARCHAR(15) : PK Name: VARCHAR(15)

Age: INT(4)

Sex: CHAR(10) : Male/Female Address: VARCHAR(20) Passenger_Tickets

PPNO: VARCHAR(15) : PK

Ticket_No: NUMERIC(9)

Reservation

PNR_No: NUMERIC(9) : FK

Journey_date: DATETIME(8) No_of_seats: INT(8) Address: VARCHRA(50)

Contact_No: NUMERIC(9) --> Should not less than 9 and Should not accept any other character other than interger

STATUS: CHAR(2) : Yes/No

Cancellation

PNR_No: NUMERIC(9) : FK

Journey_date: DATETIME(8) No_of_seats: INT(8) Address: VARCHRA(50)

Contact_No: NUMERIC(9) --> Should not less than 9 and Should not accept any other character other than interger

STATUS: CHAR(2) : Yes/No

Ticket

Ticket_No: NUMERIC(9) : FK Journey_date: DATETIME(8) Age: INT(4)

Sex: CHAR(10) : Male/Female Source: VARCHAR Destination: VARCHAR Dep_time: VARCHAR

REFERENCE BOOKS:

1. Introduction to SQL, Rick F.vanderLans, Pearson education.
2. Oracle PL/SQL, B.Rosenzweig and E.Silvestrova, Pearson education.
3. Oracle PL/SQL Programming, Steven Feuerstein, SPD.
4. SQL & PL/SQL for Oracle 10g, Black Book, Dr. P.S. Deshpande, Dream Tech.
5. Oracle Database 11g PL/SQL Programming, M. Mc Laughlin, TMH.
6. SQL Fundamentals, J.J. Patrick, Pearson Education.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2030575: PYTHON PROGRAMMING LAB

II Year B.Tech. DS I – Sem.

L	T	P	C
0	0	3	1.5

Prerequisites: NIL

Course Objectives:

- Handle Strings and Files in Python.
- Understand Lists, Dictionaries and Regular expressions in Python.
- Understand FILES, Multithread programming in Python.
- Understand GUI in python.

Course Outcomes: After learning the contents of this paper the student must be able to

- Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
- Demonstrate proficiency in handling Strings and File Systems.
- Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries .
- Develop programs using Graphical user interface.

Exercise 1 –Python Numbers

a) Write a program to determine whether a given year is a leap year, using the following formula: a leap year is one that is divisible by four, but not by one hundred, unless it is also divisible by four hundred. For example, 1992, 1996, and 2000 are leap years, but 1967 and 1900 are not. The next leap year falling on a century is 2400.

b) Write a program to determine the greatest common divisor and least common multiple of a pair of integers.

c) Create a calculator application. Write code that will take two numbers and an operator in the format: N1 OP N2, where N1 and N2 are floating point or integer values, and OP is one of the following: +, -, *, /, %, **, representing addition, subtraction, multiplication, division, modulus/remainder, and exponentiation, respectively, and displays the result of carrying out that operation on the input operands.
Hint: You may use the string split() method, but you cannot use the exal () built-in function.

Exercise –2 Control Flow

a) Write a Program for checking whether the given number is a prime number or not.

b) Write a program to print Fibonacci series upto given n value.

c) Write a program to calculate factorial of given integer number.

Exercise 3 Control Flow -Continued

a) Write a program to calculate value of the following series 1+x-x2+x3-x4+ ---- xn.

b) Write a program to print pascal triangle.

Exercise 4 – Python Sequences

a) Write a program to sort the numbers in ascending order and strings in reverse alphabetical order.

Given an integer value, return a string with the equivalent English text of each digit. For example, an input of 89 results in "eight-nine" being returned. Write a program to implement it.

Exercise 5– Python Sequences

a) Write a program to create a function that will return another string similar to the input string, but with its case inverted. For example, input of "Mr. Ed" will result in "mR.eD" as the output string.
b) Write a program to take a string and append a backward copy of that string, making a palindrome.

Exercise 6– Python Dictionaries

a) Write a program to create a dictionary and display its keys alphabetically.
b) Write a program to take a dictionary as input and return one as output, but the values are now the keys and vice versa.

Exercise - 7 Files

a) Write a program to compare two text files. If they are different, give the line and column numbers in the files where the first difference occurs.
b) Write a program to compute the number of characters, words and lines in a file.

Exercise - 8 Functions

a) Write a function ball collide that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding.
Hint: Represent a ball on a plane as a tuple of (x, y, r), r being the radius
b) If (distance between two balls centers) <= (sum of their radii) then (they are colliding)
c) Find mean, median, mode for the given set of numbers in a list.
d) Write simple functions max2() and min2() that take two items and return the larger and smaller item, respectively. They should work on arbitrary Python objects. For example, max2(4, 8) and min2(4, 8) would each return 8 and 4, respectively.

Exercise - 9 Functions - Continued

a) Write a function nearly equal to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b.
b) Write a function dups to find all duplicates in the list.
c) Write a function unique to find all the unique elements of a list.

Exercise - 10 - Functions - Problem Solving

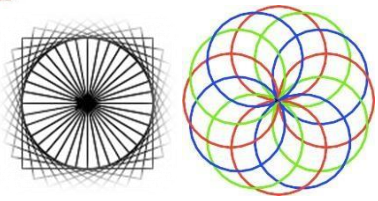
a) Write a function cumulative_ product to compute cumulative product of a list of numbers.
b) Write a function reverse to reverse a list. Without using the reverse function.
c) Write function to compute GCD, LCM of two numbers. Each function shouldn"t exceed one line.

Exercise - 11 GUI, Graphics

a) Write a GUI for an Expreson Calculator using tk
b) Write a program to implement the following figures using turtle

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)



TEXT BOOKS:

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson.

REFERENCES:

1. Think Python, Allen Downey, Green Tea Press
2. Introduction to Python, Kenneth A. Lambert, Cengage
3. Python Programming: A Modern Approach, VamsiKurama, Pearson
4. Learning Python, Mark Lutz, O"Really.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2030022:GENDER SENSITIZATION

II Year B.Tech. DS I – Sem.

L	T	P	C
2	0	0	0

Prerequisites: NIL

Course Objectives:

- To develop students„ sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women

Course Outcomes: After learning the contents of this paper the student

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.

UNIT – I

UNDERSTANDING GENDER

Gender: Why Should We Study It? (*Towards a World of Equals:* Unit -1)

Socialization: Making Women, Making Men (*Towards a World of Equals:* Unit -2) Introduction. Preparing for Womanhood. Growing up Male. First lessons in Caste. Different Masculinities.

UNIT - II

GENDER AND BIOLOGY

Missing Women: Sex Selection and Its Consequences (*Towards a World of Equals:* Unit -4) Declining Sex Ratio. Demographic Consequences**.**

Gender Spectrum: Beyond the Binary (*Towards a World of Equals:* Unit -10) Two or Many? Struggles with Discrimination.

UNIT - III

GENDER AND LABOUR

Housework: the Invisible Labour (*Towards a World of Equals:* Unit -3) **–**My Mother doesn„t Work.‖ –Share the Load.‖

Women's Work: Its Politics and Economics (*Towards a World of Equals:* Unit -7) Fact and Fiction. Unrecognized and Unaccounted work. Additional Reading: Wages and Conditions of

Work.

UNIT - IV
ISSUES OF VIOLENCE
Sexual Harassment: Say No! (*Towards a World of Equals:* Unit -6)
Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- FurtherReading: –Chupulu

Domestic Violence: Speaking Out (Towards a World of Equals: Unit -8)
Is Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Additional Reading: New Forums for Justice.
Thinking about Sexual Violence (Towards a World of Equals: Unit -11)
Blaming the Victim-—I Fought for my Life….‖ - Additional Reading: The Caste Face of Violence.

UNIT – V
GENDER: CO - EXISTENCE
Just Relationships: Being Together as Equals (Towards a World of Equals: Unit -12) Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Additional Reading: Rosa Parks-The Brave Heart.

TEXTBOOKS:

1. All the five Units in the Textbook, “Towards a World of Equals: A Bilingual Textbook on Gender” written by A. Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu and published by Telugu Akademi, Hyderabad,Telangana State in the year 2015.

REFERENCES:

1. Menon, Nivedita. Seeing like a Feminist. New Delhi: Zubaan-Penguin Books, 2012
2. Abdulali Sohaila. —I Fought For My Life…and Won.‖Available online at: http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2040506: DISCRETE MATHAMATICS

II Year B.Tech. DS II – Sem.

L	T	P	C
3	1	0	4

Prerequisites: A course on Data Structures and Mathematics**.**

Course Objectives:

- To introduce the concepts of mathematical logic.
- To introduce the concepts of sets, relations, and functions.
- To perform the operations associated with sets, functions, and relations.
- To introduce generating functions and recurrence relations.
- To use Graph Theory for solving problems.

Course Outcomes: The students should be able to.

- Apply mathematical logic to solve problems.
- Understand sets, relations, functions, and discrete structures.
- Use logical notation to define and reason about fundamental mathematical concepts such as sets, relations, and functions.
- Formulate problems and solve recurrence relations.
- Model and solve real-world problems using graphs and trees.

UNIT - I

Mathematical logic: Introduction, Statements and Notation, Connectives, well formed formula, Equivalence of formulas, Normal forms, Theory of inference for the statement calculus, predicate calculus, Inference theory of predicate calculus.

UNIT - II

Set theory: Basic concepts of set theory, Set and Operations on sets, Relations and ordering, properties of binary relations in a set, Equivalence relation, Compatibility of relation, partial order relation, partial order set, Functions, Composition of functions, Inverse function, Recursive functions.

UNIT-III

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumeration of Combinations and permutations, Binomial Coefficients, Binomial and Multinational Theorems, Principle of Inclusion-Exclusion.

UNIT-IV

Recurrence Relations: Generating Functions of Sequences, Calculating Coefficients of generating functions, Recurrence relations, Solving recurrence relations by substitution and generating functions, Method of Characteristic roots, Solutions of Inhomogeneous Recurrence Relations.

UNIT – V

Graph Theory: Basic Concepts, Isomorphism and Sub graphs, Trees and their Properties, Spanning Trees, Directed Trees, Binary Trees, Planar Graphs, Euler"s Formula, Multi graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, Four color problems**.**

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

TEXT BOOKS:

1. Discrete Mathematical Structures with Applications to Computer Science, J.P. Tremblay, R. Manohar, McGraw Hill education (India) Private Limited. (UNITS - I ,II)
2. Discrete Mathematics for Computer Scientists & Mathematicians, Joe L. Mott, Abraham Kandel, Theodore P. Baker, Pearson , 2nd ed. (Units - III, IV, V)

REFERENCES:

1. Discrete Mathematics and its Applications, Kenneth H. Rosen, 7th Edition, McGraw Hill education (India) Private Limited.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2040201:BASIC ELECTRICAL ENGINEERING

II Year B.Tech. DS II – Sem.	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Prerequisites: NIL

Course Objectives:

- To analyse and solve electric circuits.
- To provide an understanding of basics in Electrical circuits.
- To identify the types of electrical machines for a given application.
- To explain the working principles of Electrical Machines and single phase transformers.

Course Outcomes:

After completion of this course the student is able to

- Analyse Electrical circuits to compute and measure the parameters of Electrical Energy.
- Comprehend the working principles of Electrical DC Machines.
- Identify and test various electrical switchgear, single phase transformers and assess the ratings needed in given application.
- Comprehend the working principles of electrical AC machines.

UNIT-I DC Circuits:

Electrical circuit elements (R, L and C), voltage and current sources, Kirchhoff current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin„s and Norton„s Theorems.

Unit-II AC Circuits:

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power and power factor. Analysis of single-phase ac circuits consisting of R, L, C, and RL, RC, RLC combinations (series only). Three phase balanced circuits, voltage and current relations in star and delta connections.

UNIT-III Transformers:

Ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections.

UNIT-IV: Electrical Machines:

Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic and speed control of separately excited dcmotor. Construction and working of synchronous generators.

UNIT-V Electrical Installations:

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary

calculations for energy consumption, power factor improvement and battery backup.

TEXT BOOKS:

1. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshaiah – TMH.
2. Basic Electrical Engineering –By T.K.Nagasarkar and M.S. Sukhija Oxford University Press.

REFERENCES:

1. Theory and Problems of Basic Electrical Engineering by D.P.Kothari & I.J. Nagrath PHI.
2. Principles of Electrical Engineering by V.K Mehta, S.Chand Publications.
3. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin Pearson.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2030010: BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

II Year B.Tech. DS II – Sem.

L	T	P	C
3	0	0	3

Prerequisites: A Course on "Data Structure and Linear Algebra".

Course Objectives:

- To learn the basic Business types, impact of the Economy on Business and Firms specifically.
- To analyze the Business from the Financial Perspective.

Course Outcomes:

- The students will understand the various Forms of Business and the impact of economic variables on the Business. The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt. The Students can study the firm„s financial position by analyzing the Financial Statements of a Company

UNIT-I

Introduction to Business and Economics: Business: Structure of Business Firm, Types of Business Entities, Limited Liability Companies, Economics: Significance of Economics, Micro and Macro Economic Concepts, Business Cycle, Features and Phases of Business Cycle. Nature and Scope of Business Economics, Role of Business Economist

Course outcomes:

By going through this unit, technical students can have the scope of learning about different economic concepts, business cycles and nature of business economists.

UNIT – II

Demand Analysis: Elasticity of Demand: Elasticity, Types of Elasticity, Law of Demand, Measurement and Significance of Elasticity of Demand, Factors affecting Elasticity of Demand, Demand Forecasting: Steps in Demand Forecasting, Methods of Demand Forecasting.

Course outcomes:

By going through this content, student can learn about different types of demand, its determinants and elasticity of demand concepts thoroughly and how to forecast the demand of different things by using different agreed upon techniques.

UNIT - III

Production, Cost, Market Structures & Pricing: Production Analysis: Factors of Production, Production Function, Different Types of Production Functions. Cost analysis: Types of Costs, Short run and Long run Cost Functions. Market Structures: Features of Perfect competition, Monopoly, Oligopoly, and Monopolistic Competition. Pricing: Types of Pricing, Break Even Analysis, and Cost Volume Profit Analysis.

Course outcomes:

By reading this chapter, student can learn different pricing techniques in different market structures and different cost functions that determine products life cycle in a long term basis.

UNIT – IV

Capital Budgeting: Importance of Capital Budgeting, methods of Capital Budgeting: Traditional Methods: Pay Back Period, Accounting Rate of Return, and Discounting Methods: Net Present Value, Profitability Index, Internal Rate of Return; Financial Analysis through Ratios: Concept of Ratio Analysis, Liquidity Ratios, Turnover Ratios, Profitability Ratios, Proprietary Ratios, Solvency, Leverage Ratios (simple problems).

Course outcomes:

By going thoroughly through this unit, students can have the scope of learning about different techniques by which a project can be evaluated from financials perspective and utilization of ratios at different times to assess the business position for decision making.

UNIT - V

Financial Accounting: Accounting concepts and Conventions, Accounting Equation, Double-Entry system of Accounting, Rules for maintaining Books of Accounts, Journal, Posting to Ledger, Preparation of Trial Balance, Elements of Financial Statements, and Preparation of Final Accounts.

Course outcomes:

Students can learn the methodology of accounting cycle which is valid from stakeholders„ point of view and they can learn the comparison of the different firms at a time, so that they can take appropriate decision of either investment or to become an entrepreneur.

TEXT BOOKS:

1. D. D. Chaturvedi, S. L. Gupta, Business Economics - Theory and Applications, International Book House Pvt. Ltd. 2013.
2. Dhanesh K Khatri, Financial Accounting, Tata McGraw Hill, 2011.
3. Geethika Ghosh, Piyali Gosh, Purba Roy Choudhury, Managerial Economics, 2e, Tata McGraw Hill Education Pvt. Ltd. 2012.
4. I.M. Pandey, Financial Management, 11th Edition, Kindle Edition, 2015.

REFERENCE:

1. Paresh Shah, Financial Accounting for Management 2e, Oxford Press, 2015.
2. S. N. Maheshwari, Sunil K Maheshwari, Sharad K Maheshwari, Financial Accounting, 5e, Vikas Publications, 2013

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2040509: JAVA PROGRAMMING

II Year B.Tech. DS II – Sem.	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Prerequisites: A Course on Programming for problem solving.

Course Objectives:

- To introduce the object-oriented programming concepts.
- To understand object-oriented programming concepts, and apply them in solving problems.
- To introduce the principles of inheritance and polymorphism; and demonstrate how they relate to the design of abstract classes.
- To introduce the implementation of packages and interfaces.
- To introduce the concepts of exception handling and multithreading.
- To introduce the design of Graphical User Interface using applets and swing controls.

Course Outcomes: The students should be able to

- Solve real world problems using OOP techniques.
- Understand the use of abstract classes.
- Solve problems using java collection framework and I/o classes.
- Develop multithreaded applications with synchronization.
- Develop applets for web applications.
- Design GUI based applications

UNIT - I

Object oriented thinking: A way of viewing world – Agents, responsibility, messages, methods,

Classes and instances, class hierarchies – inheritance, method binding, overriding and exceptions summary of oop concepts.

History of Java, Java buzzwords, data types, variables, scope and life time of variables, Type conversion and casting, arrays, operators, Operator Precedence, control statements.

Classes: Class fundamentals, Declaring Objects, methods, Constructors, this keyword, garbage collection, Overloading methods and constructors, Recursion.

UNIT - II

Inheritance, Packages and Interfaces – Inheritance basics, Using super, Creating a multilevel hierarchy, method overriding, Dynamic method dispatch, abstract classes, Using final with inheritance, Defining a package, Finding package and classpath, Access protection, importing packages, Defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT-III

Exception handling and Multithreading- Exception types, uncaught exceptions, using try and catch, Multiple catch classes, nested try statements, throw, throws and finally. Java‟s built-in

exceptions, chained exceptions, creating own exception sub classes. Java thread model, thread priorities, synchronization, messaging, thread class and runnable interface, creating thread, creating multiple threads, thread priorities, synchronizing threads, inter thread communication, thread life cycle.

UNIT-IV

Event Handling : Events, Event sources, Event Listeners, Event classes, Event listener interface, Handling mouse and keyboard events, Adapter classes, The AWT class hierarchy, AWT controls-labels, buttons, scrollbars, text field, check box, check box groups, choices, handling lists, dialogs, Menubar, layout manager – layout manager types – border, grid, flow, card and grid bag.

UNIT – V

Applets – Types, Applet basics, Applet architecture, applet skleton, simple applet display methods, passing parameters to applets. Swing – Introduction, MVC connection, components, containers, exploring swing- Japplet, Jframe and Jcomponent, Icons and Labels, text fields, buttons – The Jbutton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

TEXT BOOKS:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill Education (India) Pvt.Ltd.
2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, PearsonEducation.(UNIT-I first part)

REFERENCES:

1. An Introduction to programming and OO design using Java, J. Nino and F.A. Hosch, JohnWiley & sons
2. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
3. Object Oriented Programming through Java, P. Radha Krishna, University Press.
4. Programming in Java, S. Malhotra, S. Chudhary, 2nd edition, Oxford Univ. Press.
5. Java Programming and Object-oriented Application Development, R. A. Johnson, CengageLearning.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

20467071-INTRODUCTION TO DATA SCIENCE

II Year B.Tech. DS II – Sem.	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Prerequisites: Basics concepts of Python and Database management systems**.**

Course Objectives:

- To get knowledge on data science process.
- To get basic understanding of how to apply python to data science.
- To understand the concepts of Statistical Natural Language Processing for Sentiment Analysis

Course Outcomes: The students should be able to

- Understand the process of data science.
- Use Python libraries for data preparation and processing.
- Understand the Statistical inference.
- Describe network analysis and Recommender systems.

UNIT – I

Data science in a big data world: Benefits and uses of data science and big data, Facets of Data,The data science process, Big data eco system and data science.

Data science process: Defining research goals and creating a project charter, Retrieving data, Cleansing, integrating, and transforming data, exploratory data analysis, Build the models, presenting findings and building applications on top of them.

UNIT-II

Toolboxes for Data Scientists: Python Libraries for Data Scientists , Get Started with Python for Data Scientists*.*

Descriptive Statistics: Data Preparation. Exploratory Data Analysis, Estimation.

UNIT-III

Statistical Inference: The Frequentist Approach, Measuring the Variability in Estimates. Hypothesis Testing Supervised Learning: Learning Curves , Training, Validation and Test, Regression Analysis: Linear Regression, Multiple Linear Regression, Logistic Regression.

UNIT-IV

Network Analysis: Basic Definitions in Graphs, Social Network Analysis, Centrality, Ego-Networks, Community Detection

Recommender Systems: How Do Recommender Systems Work? Modeling User Preferences, Evaluating Recommenders, Practical case: MovieLens Dataset

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

UNIT-V

Statistical Natural Language Processing for Sentiment Analysis: Data Cleaning, Text Representation, Practical Cases, Parallel Computing.: Architecture, Multicore Programming, Distributed Computing.

A Real time Application: New York Taxi Trips

TEXT BOOK:

1. Introduction to data science by davy cielen, arno d. B. Meysman, mohamed ali manning shelter island.
2. “Introduction to Data Science” A Python Approach to Concepts, Techniques and ApplicationsBy Laura Igual · Santi Seguí Spinger.

REFERENCES:

1. Michael Berthold, David J. Hand, “Intelligent Data Analysis”, Springer, 2007.
2. Anand Rajaraman and Jeffrey David Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2012.
3. Bill Franks, “Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics”, John Wiley & sons, 2012.
4. Jiawei Han, Micheline Kamber “Data Mining Concepts and Techniques”, Second Edition, Elsevier, Reprinted 2008.
5. Rachel Schutt, Cathy O'Neil, “Doing Data Science”, O'Reilly Publishers, 2013

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2046702-DATA WAREHOUSING AND DATA MINING

II Year B.Tech. DS II – Sem.

L	T	P	C
2	0	0	2

Prerequisites: NIL

Course Objectives:

- Be familiar with mathematical foundations of data mining tools.
- Understand and implement classical models and algorithms in data warehouses and datamining.
- Characterize the kinds of patterns that can be discovered by association rule mining,classification and clustering.
- Master data mining techniques in various applications like social, scientific and environmental context.
- Develop skill in selecting the appropriate data mining algorithm for solving practical problems.

Course Outcomes: The students should be able to

- Understand the functionality of the various data mining and data warehousing component.
- Appreciate the strengths and limitations of various data mining and data warehousing models.
- Explain the analyzing techniques of various data.
- Describe different methodologies used in data mining and data ware housing.
- Compare different approaches of data ware housing and data mining with various technologies. Evaluating

UNIT – I:

Data Warehouse basic concepts: what is a Data warehouse, Differences between operational data base systems and data Warehouse, Architecture, Models, Extraction-Transformation-Loading, Metadata repository.

Data Warehousing Modeling, Data Cube, star and snow-Flake Schema, Fact Constellation, Dimensions, Measures, OLAP Operations.

UNIT -II

Introduction to Data Mining: Introduction, What is Data Mining, KDD

Data Preprocessing- Data processing overview, Data Cleaning, Data integration, Data Reduction, Data Transformation and Data Discretization.

UNIT -III

Classification: Preliminaries, General Approaches to solving a classification problem, Decision trees-Induction, Decision Tree Construction, nearest neighbor classifier, Bayesian classifier, ANN, SVM**.**

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

UNIT – IV

Association Rules: Problem Definition, Frequent Item Set Generation, The APRIORI Principle, Rule Generation- Rule Generation in APRIORI Algorithm, Compact Representation of Frequent Item Set-Maximal Frequent Item Set, Closed Frequent Item Set, FP-Growth Algorithms.

UNIT – V

Cluster Analysis: Clustering overview, different types of clustering, K-Means Algorithm-K- Means Additional Issues, PAM Algorithm, Agglomerative Hierarchical Clustering Algorithm, Specific techniques, Key Issues in Hierarchical Clustering, Strengths and weakness, DBSCAN, Cluster evolution.

TEXT BOOK:

1. Data Mining-Concepts and Techniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2 Edition, 2006. (UNIT 1 and 2)
2. Introduction to Data Mining, Pang-Ning Tan, Vipin Kumar, Michael Steinbanch, Pearson Education. (. (UNIT 3,4 and 5).

REFERENCES:

1. Data Mining Techniques, Arun K Pujari, 3rd Edition, Universities Press.
2. Data Ware Housing Fundamentals, PualrajPonnaiah, Wiley Student Edition
3. The Data Ware House Life Cycle Toolkit- Ralph Kimball, Wiley Student Edition.
4. Data Mining, VikaramPudi, P Radha Krishna, Oxford University.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2040271: BASIC ELECTRICAL ENGINEERING LAB

II Year B.Tech. DS II – Sem.

L	T	P	C
0	0	2	1

Prerequisites: NIL

Course Objectives:

- To analyze a given network by applying various electrical laws and network theorems
- To know the response of electrical circuits for different excitations
- To calculate, measure and know the relation between basic electrical parameters.
- To analyze the performance characteristics of DC and AC electrical machines.

Course Outcomes:

- Get an exposure to basic electrical laws.
- Understand the response of different types of electrical circuits to different excitations.
- Understand the measurement, calculation and relation between the basic electrical parameters
- Understand the basic characteristics of transformers and electrical machines.

List of experiments/demonstrations:

1. Verification of Ohms Law
2. Verification of KVL and KCL
3. Verification of superposition theorem.
4. Verification of Thevenin„s and Norton„s theorem.
5. Resonance in series RL Ccircuit.
6. Calculations and Verification of Impedance and Current of RL, RC and RLC seriescircuits.
7. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single Phase Transformer.
8. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation)
9. Three Phase Transformer: Verification of Relationship between Voltagesand Currents (Star-Delta, Delta-Delta, Delta-star, Star-Star)
10. Measurement of Active and Reactive Power in a balanced Three-phase circuit.
11. Performance Characteristics of a Separately/Self Excited DC Shunt/Compound Motor.
12. Torque-Speed Characteristics of a Separately/Self Excited DCShunt/Compound Motor.
13. Performance Characteristics of a Three-phase Induction Motor.
14. Torque-Speed Characteristics of a Three-phase Induction Motor.
15. No-Load Characteristics of a Three-phase Alternator.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2046771-DATA WAREHOUSING AND DATA MINING LAB

II Year B.Tech. DS II – Sem.

L	T	P	C
0	0	2	1

Prerequisites: NIL

Course Objectives:

- Get the acquaintance to WEKA tool
- Competent to preprocess the data for mining
- Proficient in generating association rules
- Build various classification models
- Realise clusters from the available data

LIST OF EXPERIMENTS:

1. Basics of WEKA tool
    a. Investigate the Application interfaces.
    b. Explore the default datasets.
2. Pre-process a given dataset based on the following:
    a. Attribute Selection
    b. Handling Missing Values
    c. Discretization
    d. Eliminating Outliers
3. Pre-process a given dataset based on the following:
    a. Discretization
    b. Eliminating Outliers
4. Create a dataset in ARFF (Attribute-Relation File Format) for any given dataset and performMarket-Basket Analysis.
5. Generate Association Rules using the Apriori algorithm.
6. Generate Association Rules using the FP-Growth algorithm.
7. Build a Decision Tree by using ID3 algorithm.
8. Build various Regression models.
9. Cluster the given dataset by using the k-Means Clustering algorithm and visualize the cluster mean values and standard deviation of dataset attributes.
10. Cluster the given dataset by using the DBSCAN Clustering algorithm.
11. Cluster the given dataset by using the Expectation Maximization clustering algorithm.

TEXT BOOKS:

1. JlaweiHan and Kamber, ”Data Mining Concepts and Techniques”, Third Edition, Elsevier, 2011.

REFERENCES:

1. Ian H.Witten,EibeFank, Mark A Hall, “Data Mining Practical Machine Learning Tools and Techniques”, Third edition,Morgan Kaufmann Publishers, 2011.

WEB REFERENCE:

www.cs.waikato.ac.nz/ml/weka/downloading.html

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2046672: JAVA PROGRAMING LAB

II Year B.Tech. DS II – Sem.	**L**	**T**	**P**	**C**
	0	**0**	**3**	**1.5**

Prerequisites: Programming for problem solving lab

Course Objectives:

- Get the acquaintance to WEKA tool
- To write programs using abstract classes.
- To write programs for solving real world problems using java collection frame work.
- To write multithreaded programs.
- To write GUI programs using swing controls in Java.

Course Outcomes:

- Write programs for solving real world problems using java collection frame work.
- Write programs using abstract classes.
- Write multithreaded programs.
- Write GUI programs using swing controls in Java.

List of experiments:

1. a) Use Eclipse or Net bean platform and acquaint with the various menus. Create a test project, add a test class, and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods, and classes. Try debug step by step with a small program of about 10 to 15 lines which contains at least one if else condition and a for loop.
   b) 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.
   c) Write a java program to implement Fibonacci series.

2. a) Write a java program to implement method overloading and constructors overloading.
   b) Write a java program to implement method overriding.

3. a) Write a java program to check whether a given string is palindrome.
   b) Write a Java program to create an abstract class named Shape that contains two integers and an empty method named print Area (). Provide three classes named Rectangle, Triangle, and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape.

4. a) Write a Java program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num 2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception. Display the exception in a message dialog box.
   b).Write a java program to create user defined exception class and test this class.

5. a) Write a Java program to list all the files in a directory including the files present in all its subdirectories.

   b) Write a java program that displays the number of characters, lines and words in a textfile.

6. a) Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will printthe value of cube of the number.

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

7. Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Labels in Grid Layout.

8. Write a Java program that loads names and phone numbers from a text file where the data is organized as one line per record and each field in a record are separated by a tab (\t). It takes a name or phone number as input and prints the corresponding other value from the hash table (hint: use hash tables).

9. a) Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired (Use Adapter classes).

   b) Write a java program to demonstrate the key event handlers.

10. a) Develop an applet in Java that displays a simple message.

    b) Develop an applet in Java that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named “Compute” is clicked.

11. Write a Java program that works as a simple calculator. Use a grid layout to arrange Buttons for the digits and for the +, -,*, % operations. Add a text field to display the Result. Handle any possible exceptions like divided by zero.

12. Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an Appropriate message with “Stop” or “Ready” or “Go” should appear above the buttons in selected color. Initially, there is no message shown.

13. Develop Swing application which uses JList, JTree, JTable, JTabbedPane and JScrollPane.

14. Write a Java program that implements Quick sort algorithm for sorting a list of names in ascending order

15. Write a Java program that implements Bubble sort algorithm for sorting in descending orderand also shows the number of interchanges occurred for the given set of integers.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

REFERENCES:

1. Java for Programmers, P. J. Deitel and H. M. Deitel, 10th Edition Pearson education.
2. Thinking in Java, Bruce Eckel, Pearson Education.
3. Java Programming, D. S. Malik and P. S. Nair, Cengage Learning.
4. Core Java, Volume 1, 9th edition, Cay S. Horstmann and G Cornell,

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2040023: CONSTITUTION OF INDIA

II Year B.Tech. DS II – Sem.

L	T	P	C
2	0	0	0

The Constitution of India is the supreme law of India. Parliament of India cannot make any law which violates the Fundamental Rights enumerated under the Part III of the Constitution. The Parliament of India has been empowered to amend the Constitution under Article 368, however, it cannot use this power to change the ―basic structure‖ of the constitution, which has been ruled and explained by the Supreme Court of India in its historical judgments. The Constitution of India reflects the idea of ―Constitutionalism‖ – a modern and progressive concept historically developed by the thinkers of ―liberalism‖ – an ideology which has been recognized as one of the most popular politicalideology and result of historical struggles against arbitrary use of sovereign power by state. The historic revolutions in France, England, America and particularly European Renaissance and Reformation movement have resulted into progressive legal reforms in the form of ―constitutionalism‖ in many countries. The Constitution of India was made by borrowing models and principles from many countries including United Kingdom and America.

The Constitution of India is not only a legal document but it also reflects social, political and economic perspectives of the Indian Society. It reflects India„s legacy of ―diversity‖. It has been said that Indian constitution reflects ideals of its freedom movement; however, few critics have argued that it does not truly incorporate our own ancient legal heritage and cultural values. No law can be ―static‖ and therefore the Constitution of India has also been amended more than one hundred times. These amendments reflect political, social and economic developments since the year 1950. The Indian judiciary and particularly the Supreme Court of India has played an historic role as the guardian of people. It has been protecting not only basic ideals of the Constitution but also strengthened the same through progressive interpretations of the text of the Constitution. The judicial activism of the Supreme Court of India and its historic contributions has been recognized throughout the world and it gradually madeit ―as one of the strongest court in the world‖.

Course content

1. Meaning of the constitution law and constitutionalism
2. Historical perspective of the Constitution of India
3. Salient features and characteristics of the Constitution of India
4. Scheme of the fundamental rights
5. The scheme of the Fundamental Duties and its legal status
6. The Directive Principles of State Policy – Its importance and implementation
7. Federal structure and distribution of legislative and financial powers between theUnion and the States
8. Parliamentary Form of Government in India – The constitution powers and status ofthe President of India
9. Amendment of the Constitutional Powers and Procedure
10. The historical perspectives of the constitutional amendments in India
11. Emergency Provisions: National Emergency, President Rule, Financial Emergency
12. Local Self Government – Constitutional Scheme in India
13. Scheme of the Fundamental Right to Equality
14. Scheme of the Fundamental Right to certain Freedom under Article 19

15. Scope of the Right to Life and Personal Liberty under Article 21

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2050511-COMPUTER NETWORKS

III Year B.Tech. DS I – Sem.

L	T	P	C
2	0	0	2

Prerequisites: NIL

Course Objectives:

- To introduce the fundamental various types of computer networks.
- To demonstrate the TCP/IP and OSI models with merits and demerits.
- To introduce UDP and TCP Models.

Course Outcomes: The students should be able to

- Understand and explore the basics of computer networks and various protocols.
- Understand the World Wide Web concepts.
- Administrate a network and flow of information further
- Understand easily the concept of network security, mobile and ad hoc networks.

UNIT – I

Data Communications: Components – Direction of Data flow – Networks – Components and Categories – Types of Connections – Topologies –Protocols and Standards – ISO / OSI model, **Physical layer:** Transmission modes, Multiplexing, Transmission Media, Switching, Circuit Switched Networks, Datagram Networks, and Virtual Circuit Networks.

UNIT –II

Data link layer: Introduction, Framing, and Error – Detection and Correction – Parity – LRC CRC Hamming code, Flow and Error Control, Noiseless Channels, Noisy Channels, HDLC, Point to Point Protocols. 111 Medium Access sub layer: ALOHA, CSMA/CD, LAN Ethernet IEEE 802.3, IEEE 802.5 – IEEE 802.11, Random access, Controlled access, Channelization.

UNIT -III

Network layer: Logical Addressing, Internetworking, Tunneling, Address mapping, ICMP, IGMP, Forwarding, Routing Protocols: Distance Vector Routing, Link state Routing, Path vector Routing.

UNIT – IV

Transport Layer: Process to Process Delivery, UDP, TCP: TCP Segments, TCP Connection, TCP sliding window, Data Traffic, Congestion, Congestion Control, QoS, QoS in Switched Networks.

UNIT – V

Application Layer: Domain name space, DNS in internet, electronic mail, SMTP, FTP, WWW, HTTP, SNMP.

TEXT BOOKS:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.

2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

REFERENCES:

1. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Education.
2. Understanding communications and Networks, 3rd Edition, W. A. Shay, Cengage Learning.
3. Introduction to Computer Networks and Cyber Security, Chwan-Hwa (John) Wu, J. David Irwin, CRC Press.
4. Computer Networks, L. L. Peterson and B. S. Davie, 4th edition, ELSEVIER.
5. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, K. W. Ross, 3rd Edition, Pearson Education.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2050518: MACHINE LEARNING

III Year B.Tech. DS I – Sem.

L	T	P	C
3	0	0	3

Prerequisites:

- A course on “Data Structures”.
- A course on “Probability and Statistics”.
- A course on “Artificial Intelligence”.

Course Objectives:

- To explain different Machine Learning Techniques
- To understand Computational Learning Theory.
- To study the Pattern Comparison Techniques.

Course Outcomes: The students should be able to

- Understand the concepts of computational intelligence like machine learning
- Ability to get the skill to apply machine learning techniques to address the real time problems in different areas
- Understand the Neural Networks and its usage in machine learning application.

UNIT – I

Introduction - Well-Posed Learning Problems, Designing a Learning System, Perspectives and Issues in Machine Learning, Supervised versus Unsupervised Learning. Concept Learning and the general to specific ordering – Introduction to Concept Learning task, Concept Learning as Search, FIND-S: finding a Maximally Specific Hypothesis, Version Spaces and Candidate Elimination algorithm, Remarks on Version Spaces and Candidate Elimination, Inductive Bias.

Decision Tree Learning – Introduction, Decision Tree representation, the Basic Decision Tree Learning algorithm, Hypothesis space search in Decision Tree learning, Inductive bias in Decision Tree learning, Issues in Decision Tree learning.

UNIT –II

Artificial Neural Networks– Introduction, Neural Network Representation, Appropriate problems for Neural Network Learning, Perceptions, Multilayer networks and the Back-Propagation Algorithm, Remarks on the Back-Propagation Algorithm, An illustrative Example: Face recognition, Advanced topics in Artificial Neural Networks.

Evaluation Hypotheses – Motivation, Estimation Hypothesis Accuracy, Basics of Sampling Theory, A General Approach for Deriving Confidence Intervals, Difference in Error of Two Hypotheses, Comparing Learning Algorithms.

UNIT –III

Bayesian learning – Introduction, Bayes theorem, Bayes theorem and concept learning, Maximum Likelihood and Least Squared Error Hypotheses, Maximum Likelihood Hypotheses for Predicting Probabilities, Minimum Description Length Principle, Bayes Optimal Classifier, Gibbs Algorithm, Naïve Bayes Classifier,Learning to Classify TextExample, Bayesian Belief Networks.

Computational learning theory – Introduction, Probably Learning an Approximately Correct

(PAC) Hypothesis, The Mistake Bound Model of Learning.

Instance-Based Learning- Introduction, k-Nearest Neighbour (KNN) algorithm, Locally Weighted Regression, Radial Basis Functions, remarks on lazy and eager learning.

UNIT – IV

Genetic Algorithms – Motivation, Genetic algorithms, an Illustrative Example, Hypothesis Space Search, Genetic Programming.

Learning Sets of Rules – Introduction, Sequential Covering Algorithms, Learning Rule sets: Learning First-Order rules, Learning Sets of First-Order rules: FOIL, Induction as Inverted Deduction, Inverting Resolution.

Reinforcement Learning – Introduction, the Learning Task, Q–learning.

UNIT – V

Analytical Learning- Introduction, Learning with Perfect Domain Theories: PROLOG-EBG, Remarks on Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge.

Combining Inductive and Analytical Learning – Motivation, Inductive-Analytical Approaches to Learning, Using Prior Knowledge to Initialize the Hypothesis, Using Prior Knowledge to alter the Search Objective, using Prior Knowledge to Augment Search Operators**.**

TEXT BOOK:

1. Data Machine Learning – Tom M. Mitchell, - MGH

REFERENCES:

1. Machine Learning: An Algorithmic Perspective, Stephen Marshland, Taylor & Francis

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2050508: DESIGN AND ANALYSIS Of ALGORITHMS

III Year B.Tech. DS I – Sem.

L	T	P	C
3	0	0	3

Prerequisites:

- Course on Programming for problem solving and Data Structures.

Course Objectives:

- Introduces the notations for analysis of the performance of algorithms.
- Introduces the data structure disjoint sets.
- Describes major algorithmic techniques (divide-and-conquer, backtracking, dynamic programming, greedy, branch and bound methods) and mention problems for which each technique is appropriate.
- Describes how to evaluate and compare different algorithms using worst-, average-, and best- case analysis.
- Explains the difference between tractable and intractable problems, and introduces the problems that are P, NP and NP complete.

Course Outcomes: The students should be able to

- Analyze the performance of algorithms
- Choose appropriate data structures and algorithm design methods for a specified application
- Understand how the choice of data structures and the algorithm design methods impact the performance of programs.

UNIT – I

Introduction: Algorithm, Performance Analysis-Space complexity, Time complexity, Asymptotic Notations- Big oh notation, Omega notation, Theta notation and little oh notation.

Disjoint Sets: Introduction, union and find Operations.

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen‟s matrix multiplication

UNIT –II

Greedy method: General method, applications- knapsack problem, Job sequencing with deadlines, Minimum cost spanning trees, Single source shortest path problem.

UNIT –III

Dynamic Programming: General method, applications- All pairs shortest path problem, Optimal binary search trees, 0/1 knapsack problem, Reliability design ,Traveling sales person problem.

UNIT – IV

Back tracking: General method, applications, n-queen‟s problem, sum of subsets problem, graph coloring, Hamiltonian cycles, knapsack problem.

UNIT – V

Branch and Bound: General method, applications - 0/1 knapsack problem, LC Branch and Bound solution, FIFO Branch and Bound solution, , Travelling sales person problem,

NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP- Complete classes, Cook"s theorem.

TEXT BOOK:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, SatrajSahni and Rajasekharan, University Press.

REFERENCES:

1. Design and Analysis of algorithms, Aho, Ullman and Hopcroft,Pearsoneducation.
2. Introduction to Algorithms, second edition,T.H.Cormen, C.E.Leiserson, R.L.Rivest, and C.Stein, PHI Pvt. Ltd./ Pearson Education.
3. Algorithm Design: Foundations, Analysis and Internet Examples, M.T. Goodrich and R. Tamassia, John Wiley and sons.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2050513: SOFTWARE ENGINEERING

II Year B.Tech. DS II – Sem.

L	T	P	C
3	0	0	3

Prerequisites:

- A course on “Data Base Management Systems”

Course Objectives:

- To provide an understanding of the working knowledge of the techniques for estimation, design, testing and quality management of large software development projects.
- To understand process models, software requirements, software design, software testing, software process/product metrics, risk management, quality management and UML diagrams.

Course Outcomes: The students should be able to

- Translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).
- Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
- Develop a simple testing report

UNIT – I

INTRODUCTION TO SOFTWARE ENGINEERING: The Evolving Role of Software, Software, Characteristics of Software, The Changing Nature of Software, Legacy Software, Software Myths.

A Generic view of process: Software engineering- a layered technology, a process framework, the capability maturity model integration (CMMI), process patterns, process assessment, personal and team process models.

Process models: The waterfall model, incremental process models, evolutionary process models, the unified process, Agile models: Extreme Programming, and Scrum.

UNIT –II

Software Requirements: Functional and non-functional requirements, user requirements, system requirements, interface specification, the software requirements document.

Requirements engineering process: Feasibility studies, requirements elicitation and analysis, requirements validation, requirements management.

UNIT -III

System models: Context models, behavioral models, data models, object models, structured methods

Design Engineering: Design process and design quality, design concepts, the design model, software architecture, Architectural styles and patterns.

Introduction to UML: Basic Building Blocks of UML- Things, Relationships and Diagrams.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

UNIT – IV

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, black-box and white-box testing, verification and validation testing, system testing, the art of debugging.

Metrics for Process and Products: Software quality, metrics for analysis model, metrics for design model, metrics for source code, metrics for testing, metrics for maintenance, metrics for software quality.

UNIT – V

Risk management: Reactive Vs proactive risk strategies, software risks, risk identification, risk projection, risk refinement, RMMM, RMMM plan.

Quality Management: Quality concepts, software quality assurance, software reviews, formal technical reviews, software reliability, the ISO 9000 quality standards.

TEXT BOOK:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, Mc Graw Hill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson Education.
3. The unified modelling language user guide Grady Booch, James Rambaugh, Ivar Jacobson, Pearson Education.

REFERENCES:

1. Software Engineering, an Engineering approach- James F. Peters, WitoldPedrycz, John Wiley.
2. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.
3. Fundamentals of object-oriented design using UML Meiler page-Jones: Pearson Education.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2050578: COMPUTER NETWORKS LAB

III Year B.Tech. DS I – Sem.

L	T	P	C
0	0	3	1.5

Course Objectives

- To understand the working principle of various communication protocols.
- To understand the network simulator environment and visualize a network topology and observe its performance.
- To analyze the traffic flow and the contents of protocol frames.

Course Outcomes: The students will be able to:

- Implement data link layer farming methods
- Analyze error detection and error correction codes.
- Implement and analyze routing and congestion issues in network design.
- Implement Encoding and Decoding techniques used in presentation layer
- Work with different network tools

LIST OF EXPERIMENTS

1. Implement the data link layer framing methods such as character, character-stuffing and bit stuffing.
2. Write a program to compute CRC code for the polynomials CRC-12 andCRC-16
3. Develop a simple data link layer that performs the flow control using the sliding window protocol, and loss recovery using the Go-Back-N mechanism.
4. Implement Dijsktra"s algorithm to compute the shortest path through a network
5. Take an example subnet of hosts and obtain a broadcast tree for the subnet.
6. Implement distance vector routing algorithm for obtaining routing tables at each node.
7. Implement data encryption and data decryption
8. Write a program for congestion control using Leaky bucket algorithm.
9. Write a program for frame sorting technique used in buffers.
10. Wire shark
    - Packet Capture Using Wire shark
    - Starting Wire shark
    - Viewing Captured Traffic
    - Analysis and Statistics & Filters.
11. How to run Nmap scan
12. Operating System Detection using Nmap
13. **Do the following using NS2 Simulator**
    - NS2Simulator-Introduction
    - Simulate to Find the Number of Packets Dropped
    - Simulate to Find the Number of Packets Dropped by TCP/UDP
    - Simulate to Find the Number of Packets Dropped due to Congestion
    - Simulate to Compare Data Rate & Throughput.
    - Simulate to Plot Congestion for Different Source/Destination

- Simulate to Determine the Performance with respect to Transmission of Packets.

TEXT BOOKS:

1. Computer Networks, Andrew S Tanenbaum, David. j. Wetherall, 5th Edition. Pearson Education/PHI.

REFERENCES:

1. An Engineering Approach to Computer Networks, S. Keshav, 2ndEdition, Pearson Education
2. Data Communications and Networking– Behrouz A. Forouzan.3rd Edition, TMH.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2050578: COMPUTER NETWORKS LAB

III Year B.Tech. DS I – Sem.

L	T	P	C
0	0	3	1.5

Prerequisites:

- A course on “Data Structures”.
- A course on “Python Programming”.
- A course on “Probability and Statistics”.

Course Objectives

- To get an overview of the various Machine Learning Techniques and can able to Demonstrate them using Python.

Course Outcomes: The students will be able to:

- Understand complexity of Machine Learning algorithms and their limitations
- Understand modern notions in data analysis-oriented computing;
- Confidently applying common Machine Learning algorithms in practice andimplementing their own;
- Apply experiments in Machine Learning using real-world data.

LIST OF EXPERIMENTS

1. The probability that it is Friday and that a student is absent is 3 %. Since there are 5 school days in a week, the probability that it is Friday is 20 %. What is theprobability that a student isabsent given that today is Friday? Apply Baye’s rule in python to get the result. (Ans: 15%)
2. Extract the data from database using python
3. Implement Find-S algorithm using python.
4. Implement Candidate-Elimination algorithm using python.
5. Implement Decision-Tree Learning algorithm using python.
6. Implement k-nearest neighbours classification using python
7. Given the following data, which specify classifications for nine combinations of VAR1 andVAR2 predict a classification for a case where VAR1=0.906 and VAR2=0.606, using the resultk- means clustering with 3 means (i.e., 3 centroids)

VAR1	VAR2	CLASS
1.713	1.586	0
0.180	1.786	1
0.353	1.240	1
0.940	1.566	0
1.486	0.759	1
1.266	1.106	0
1.540	0.419	1
0.459	1.799	1
0.773	0.186	1

8. The following training examples map descriptions of individuals onto high, medium and low credit -worthiness.

medium skiing design single twenties no ->highRisk
high golf trading married forties yes ->lowRisk
low speedway transport married thirties yes ->medRisk
medium football banking single thirties yes ->lowRisk
high flying media married fifties yes ->highRisk
low football security single twenties no ->medRisk
medium golf media single thirties yes ->medRisk
medium golf transport married forties yes ->lowRisk
high skiing banking single thirties yes ->highRisk
lowgolf unemployed married forties yes ->highRisk

Input attributes are (from left to right) income, recreation, job, status, age-group, home-owner. Find the unconditional probability of `golf' and the conditional probability of `single' given `medRisk' in the dataset?

9. Implement linear regression using python.
10. Implement Naïve Bayes theorem to classify the English text
11. Implement an algorithm to demonstrate the significance of genetic algorithm
12. Implement the finite words classification system using Back-propagation algorithm

TEXTBOOKS:

1. Machine Learning – Tom M. Mitchell, - MGH

REFERENCES:

1. Machine Learning: An Algorithmic Perspective, Stephen Marshland, Taylor & Francis

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2056673:CASE TOOLS LAB

III Year B.Tech. DS I – Sem.

L	T	P	C
0	0	2	1

Prerequisites: NIL

Course Objectives

- To understand how UML supports the entire OOAD process.
- To become familiar with all phases of OOAD.
- To understand different software testing tools and their features

Course Outcomes: The students will be able to:

- Understand the history, cost of using and building CASE tools.
- Construct and evaluate hybrid CASE tools by integrating existing tools.

LIST OF EXPERIMENTS

Students have to draw the following diagrams using UML for an ATM system whose description is given below.

1. **UML diagrams to be developed are:**
   1. Use Case Diagram.
   2. Class Diagram.
   3. Sequence Diagram.
   4. Collaboration Diagram.
   5. State Diagram
   6. Activity Diagram.
   7. Component Diagram
   8. Deployment Diagram.
   9. Test Design.
2. **Description for an ATM System**: The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem).
3. The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) – both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.
   1. The ATM must be able to provide the following services to the customer: A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs.1000. Approval must be obtained from the bank before cash is dispensed.

2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance inquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.
6. The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.) If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back. If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether rhe/she wants to do another transaction. The ATM will provide the customer with a printed receipt for each successful transaction
7. The ATM will have a key-operated switch that will allow an operator to startand stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash onhand. The machine can only be turned off when it is not servicing a customer. When the switch is moved to the "off" position, the machine will shut down, so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts, etc.

TEXTBOOK:

1. The unified modeling language user guide Grady Booch, James Rambaugh, Ivar Jacobson, Pearson Education.

REFERENCES:

1. Fundamentals of object-oriented design using UML Meiler page-Jones: Pearson Education.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2020024: INTELLECTUAL PROPERTY RIGHTS

III Year B.Tech. DS I – Sem.

L	T	P	C
2	0	0	0

UNIT – I

Introduction to Intellectual property: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

UNIT – II

Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting, and evaluating trade mark, trade mark registration processes.

UNIT – III

Law of copy rights: Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law. Law of patents: Foundation of patent law, patent searching process, ownership rights and transfer.

UNIT – IV

Trade Secrets: Trade secrete law, determination of trade secrete status, liability for misappropriations of trade secrets, protection for submission, trade secrete litigation. Unfair competition: Misappropriation right of publicity, false advertising.

UNIT – V

New development of intellectual property: new developments in trade mark law; copy right law, patent law, intellectual property audits. International overview on intellectual property, international – trade mark law, copy right law, international patent law, and international development in trade secrets law.

TEXT & REFERENCE BOOKS:

1. Intellectual property right, Deborah. E. Bouchoux, Cengage learning.
2. Intellectual property right – Unleashing the knowledge economy, prabuddha ganguli, Tata McGraw Hill Publishing company ltd

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2066602 AUTOMATA THEORY AND LANGUAGE PROCESSORS

III Year B.Tech. DS II – Sem.

L	T	P	C
3	0	0	3

Prerequisites: Basics concepts of discrete mathematics

Course Objectives:

- To understand the various phases in the design of a compiler.
- To understand the design of top-down and bottom-up parsers.
- To understand syntax directed translation schemes.
- To introduce LEX and YACC tools.
- To learn to develop algorithms to generate code for a target machine.

Course Outcomes: The students should be able to

- Design, develop, and implement a compiler for any language.
- Use LEX and YACC tools for developing a scanner and a parser.
- Design and implement LL and LR parsers.
- Design algorithms to perform code optimization in order to improve the performance of a program in terms of space and time complexity.
- Design algorithms to generate machine code

UNIT – I

Formal Language and Regular Expressions: Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA, Conversion of regular expression to NFA, NFA to DFA.

Context Free grammars: Context free grammars, derivation, parse trees, ambiguous grammar.

UNIT –II

Language Processors and parsing: Language Processors, the structure of a compiler, the science of building a compiler, programming language basics. Lexical Analysis: The Role of the Lexical Analyzer, Input Buffering, Recognition of Tokens, The Lexical-Analyzer Generator Lex, Bottom-up parsing handle pruning LR Grammar Parsing, LALR parsing.

UNIT –III

Semantics: Syntax directed translation, S-attributed and L-attributed grammars, Intermediate code – abstract syntax tree, translation of simple statements and control flow statements. Context Sensitive features – Chomsky hierarchy of languages and recognizers, Type checking, type conversions, equivalence of type expressions

UNIT – IV

Code optimization: Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

UNIT – V

Code generation: Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment, Using DAG representation of Block.

TEXT BOOK:

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

REFERENCES:

1. Modern Compiler Construction in C,Andrew W.Appel Cambridge University Press.
2. Compiler Construction, LOUDEN, Thomson

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2066703: R PROGRAMMING

III Year B.Tech. DS II – Sem.

L	T	P	C
3	0	0	3

Prerequisites: NIL

Course Objectives:

- To use different functions in R, how to read data into R, accessing R packages, writing R functions, debugging, and organizing data using R functions.
- To learn basics of statistical data analysis with examples.

Course Outcomes: The students should be able to

- Understand the Fundamentals of R.
- Understands the loading, retrieval techniques of data.
- Understand how data is analyzed and visualized using statistic functions.

UNIT – I

Introduction to Data Science, Data Analytics, Data Manipulation, Data Import Techniques, Exploratory Data Analysis, Data Visualization.

Introduction to R: What is R? – Why R? – Advantages of R over Other Programming Languages - R Studio: R command Prompt, R script file, comments – Handling Packages in R: Installing a R Package, Few commands to get started: installed.packages(), packageDescription(), help(), find.package(), library() - Input and Output – Entering Data from keyboard – Printing fewer digits or more digits – Special Values functions : NA, Inf and–inf.

UNIT –II

R Data Types: Vectors, Lists, Matrices, Arrays, Factors, Data Frame – **R - Variables:** Variable assignment, Data types of Variable, Finding Variable ls(), Deleting Variables **- R Operators:** Arithmetic Operators, Relational Operators, Logical Operator, Assignment Operators, Miscellaneous Operators - **R Decision Making**: if statement, if – else statement, if– else if statement, switch statement – **R Loops:** repeat loop, while loop, for loop - Loop control statement: break statement, next statement.

UNIT –III

R-Function :function definition, Built in functions: mean(), paste(), sum(), min(), max(), seq(), user-defined function, calling a function, calling a function without an argument, calling a function with argument values - R-Strings – Manipulating Text in Data: substr(), strsplit(), paste(), grep(), toupper(), tolower() .

UNIT – IV

Data Frames –Create Data Frame, Data Frame Access, Understanding Data in Data Frames: dim(), nrow(), ncol(), str(), Summary(), names(), head(), tail(), edit() functions - Extract Data from Data Frame, Expand Data Frame: Add Column, Add Row - Joining columns and rows in a Data frame rbind() and cbind() – Merging Data frames merge() – Melting and Casting data melt(), cast().

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

UNIT – V

Data Visualization in R

Understanding on Data Visualization, graphical functions present in R, plot various graphs like tableplot, histogram, Boxplot, customizing Graphical Parameters to improvise plots, understanding GUIs like Deducer and R Commander, introduction to Spatial Analysis.

Loading and handling Data in R: Getting and Setting the Working Directory – getwd(), setwd(), dir() - R-CSV Files - Input as a CSV file, Reading a CSV File, Analyzing the CSV File: summary(), min(), max(), range(), mean(), median(), apply() - Writing into a CSV File – R -Excel File – Reading the Excel file.

TEXT BOOK:

1. Sandip Rakshit, R Programming for Beginners, McGraw Hill Education (India),2017, ISBN :978-93-5260-455-5.

REFERENCES:

1. Seema Acharya, Data Analytics using R, McGrawHill Education (India), 2018, ISBN: 978-93-5260-524-8.
2. Andrie de Vries, Joris Meys, R for Dummies A Wiley Brand, 2nd Edition, John Wiley and Sons, Inc, 2015, ISBN: 978-1-119-05580-8

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2060516: WEB TECHNOLOGIES

II Year B.Tech. DS II – Sem.

L	T	P	C
3	1	0	4

Prerequisites:

- A course on “Java Programming”.
- A course on “Data Base Management Systems”.

Course Objectives:

- To introduce PHP Language for server side scripting
- To introduce XML and Processing of XML data
- To introduce server side programming with java servlets and JSP
- To introduce client side scripting with java scripts
-

Course Outcomes: The students should be able to

- Gain knowledge of client side scripting validation of forms and AJAX programming
- Understand server side scripting with PHP language
- Understand XML and how to parse and use XML data with java.
- Do server side programming with java servlets and JSP.

UNIT – I

Introduction to PHP: Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc., Handling File Uploads. Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies.

File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories.

UNIT –II

HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets;

XML: Introduction to XML, Defining XML tags, their attributes and values, Document Type Definition, XML Schemes, Document Object Model, XHTML Parsing XML Data – DOM and SAX Parsers in java

UNIT -III

Introduction to Servlets: Common Gateway Interface (CGt), Life cycle of a Servlet, deploying a servlet, The Servlet API, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions, connecting to a database using JDBC.

UNIT – IV

Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

UNIT – V

Client-side Scripting: Introduction to JavaScript, JavaScript language – declaring variables, scope of variables, functions. event handlers (onclick, onsubmit etc.), Document Object Model, Form validation.

TEXT BOOK:

1. Web Technologies, Uttam K Roy, Oxford University Press
2. The Complete Reference PHP — Steven Holzner, Tata McGraw-Hill

REFERENCES:

1. Web Programming, building internet applications, Chris Bates 2″edition, Wiley Dreamtech
2. Java Server Pages —Hans Bergsten, SPD O'Reilly,
3. Java Script, D.Flanagan
4. Beginning Web Programming-Jon Duckett WROX

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2060541: EMBEDDED SYSTEMS (Professional Elective-I)

III Year B.Tech. DS II – Sem.	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Prerequisites:

- A course on “Digital Logic Design”
- A course on “Computer Organization and Microprocessors”
- A course on “Programming for Problem Solving”

Course Objectives:

- To provide an overview of principles of Embedded System
- To provide a clear understanding of role of firmware, operating systems in correlation with hardware systems.

Course Outcomes: The students will be able to:

- Understand the selection procedure of processors in the embedded domain.
- Design procedure of embedded firm ware.
- Visualize the role of Real time operating systems in embedded systems.
- Evaluate the correlation between task synchronization and latency issues.

UNIT-I

Introduction to Embedded Systems: Definition of Embedded System, Embedded Systems Vs General Computing Systems, History of Embedded Systems, Classification of Embedded Systems, Major application areas, Purpose of E bedded Systems, Characteristics and Quality attributes of Embedded Systems.

UNIT-II

The Typical Embedded System: Core of the Embedded System, Memory, Sensors and Actuators, Communication Interface, Embedded Firmware, Other System components.

UNIT–III

Embedded Firmware Design and Development: Embedded Firmware Design Approaches: The Super Loop Based Approach, Embedded OS based Approach,

Embedded Firmware Development Languages: Assembly Language based Development, High Level Language Based Development, Programming in Embedded C.

UNIT–IV

RTOS Based Embedded System Design: Operating System basics, Types of Operating Systems, Tasks, Process, Threads, Multiprocessing and Multi-tasking, Task Scheduling, Threads-Processes-Scheduling putting them together, Task Communication, Task Synchronization, Device Drivers, How to choose an RTOS

UNIT-V

Integration and Testing of Embedded Hardware and Firmware: Integration of Hardware and Firmware, Boards Bring up The Embedded System Development Environment: The Integrated

Development Environment (IDE), Types of files generated on Cross-Compilation, Disassembler/ Decompiler, Simulators, Emulators and Debugging, Target Hardware Debugging, Boundary Scan.

TEXT BOOKS:

1. Shibu K V, “Introduction to Embedded Systems”, Second Edition, McGraw

REFERENCES:

1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill
2. Frank Vahid and Tony Givargis, “Embedded Systems Design” - A Unified Hardware/Software Introduction, John Wiley
3. Lyla, “Embedded Systems” –Pearson
4. David E.Simon, An Embedded Software Primer, Pearson Education Asia, First Indian Reprint 2000.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2060542: COMPUTER GRAPHICS (Professional Elective-I)

III Year B.Tech. DS II – Sem.

L	T	P	C
3	0	0	3

Prerequisites:

- A course on “Data structures”
- A course on “ Design and analysis of Algorithms”
- A course on “Mathematics-1”.

Course Objectives:

- To gain knowledge about graphics hardware devices and software used.
- To understand the three dimensional graphics and their transformations.
- To appreciate illumination and color models.
- To understand clipping techniques.

Course Outcomes: The students will be able to:

- Acquire familiarity with the relevant mathematics of computer graphics.
- Design basic graphics application programs, including animation
- Design applications that display graphic images to given specifications

UNIT-I

Introduction: 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. Output Primitives: Points and Lines, Line Drawing Algorithms (Bresenham’s and DDA Algorithm), Midpoint Circle and Ellipse Algorithms. Polygon Filling: Scan Line Algorithm, Boundary-fill and Flood-fill Algorithms.

UNIT-II

2-D Geometrical transforms: Translation, Scaling, Rotation, Reflection and Shear Transformations, Matrix Representations and Homogeneous Coordinates, Composite Transforms, **Transformations between Coordinate Systems. 2-D Viewing**: The Viewing Pipeline, Viewing Coordinate Reference Frame, Window to View-port Coordinate Transformation, Viewing Functions, Cohen-Sutherland line clipping, Sutherland-Hodgeman Polygon Clipping Algorithm.

UNIT–III

3-D Object representation: Polygon Surfaces, Quadric Surfaces, Spline Representation, Hermite Interpolation, Bezier Curve and B-spline Curves, Bezier and B-spline Surfaces, Basic Illumination Models**.**

UNIT–IV

3-D Geometric Transformations: Translation, Rotation, Scaling, Reflection and Shear Transformations, Composite Transformations. 3-D Viewing: Viewing Pipeline, Viewing Coordinates, View Volume and General Projection Transforms and Clipping**.**

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

UNIT-V

Computer Animation: Design of Animation Sequence, General Computer Animation Functions, Raster Animation, Computer Animation Languages, Key Frame Systems, Motion Specifications.

Visible Surface detection methods: Classification, Back-Face Detection, Depth-buffer, Scan-line, Depth Sorting, BSP-tree Methods.

TEXT BOOKS:

1. Donald Hearn and Pauline Baker M, “Computer Graphics”, C Version, 2nd Edition, Pearson, 2007.
2. John F. Hughes, Andries Van Dam, Morgan McGuire ,David F. Sklar , James D. Foley, Steven K. Feiner and Kurt Akeley ,”Computer Graphics: Principles and Practice in C”, 2nd Edition, Addison- Wesley Professional,2013.

REFERENCES:

1. Donald Hearn and M. Pauline Baker, Warren Carithers, “Computer Graphics With Open GL”, 4th Edition, Pearson Education, 2010.
2. Jeffrey McConnell, “Computer Graphics: Theory into Practice”, Jones and Bartlett Publishers, 2006.
3. Hill F S Jr., “Computer Graphics”, Maxwell Macmillan” , 1990.
4. Peter Shirley, Michael Ashikhmin, Michael Gleicher, Stephen R Marschner, Erik Rein hard, Kelvin Sung, and AK Peters, Fundamental of Computer Graphics, CRC Press, 2010.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2066741: PARALLEL COMPUTING (Professional Elective-I)

III Year B.Tech. DS II – Sem.	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Prerequisites:

- A course on “Computer Networks”
- A course on “Computer Organization”

Course Objectives:

- To study the scalability and clustering issues and the technology necessary for them.
- To understand the technologies enabling parallel computing.
- To study the different types of interconnection networks.
- To study the different parallel programming models.

Course Outcomes: The students will be able to:

- Understand Technologies used for Parallel Computation
- Implement different software programming models
- Develop different inter connection networks

UNIT-I

SCALABILITY AND CLUSTERING

Evolution of Computer Architecture – Dimensions of Scalability – Parallel Computer Models – Basic Concepts Of Clustering – Scalable Design Principles – Parallel Programming Overview – Processes, Tasks and Threads – Parallelism Issues – Interaction / Communication Issues – Semantic Issues In Parallel Programs.

UNIT-II

ENABLING TECHNOLOGIES

System Development Trends – Principles of Processor Design – Microprocessor Architecture Families – Hierarchical Memory Technology – Cache Coherence Protocols – Shared Memory Consistency – Distributed Cache Memory Architecture – Latency Tolerance Techniques – Multithreaded Latency Hiding.

UNIT–III

SYSTEM INTERCONNECTS

Basics of Interconnection Networks – Network Topologies and Properties – Buses, Crossbar and Multistage Switches, Software Multithreading – Synchronization Mechanisms.

UNIT–IV

PARALLEL PROGRAMMING

Paradigms And Programmability – Parallel Programming Models – Shared Memory Programming.

UNIT-V

MESSAGE PASSING PROGRAMMING

Message Passing Paradigm – Message Passing Interface – Parallel Virtual Machine.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

TEXT BOOKS:

1. Kai Hwang and Zhi.Wei Xu, “Scalable Parallel Computing”, Tata McGraw-Hill, New Delhi, 2003.

REFERENCES:

1. David E. Culler & Jaswinder Pal Singh, “Parallel Computing Architecture: A Hardware/Software Approach”, Morgan Kaufman Publishers, 1999.
2. Michael J. Quinn, “Parallel Programming in C with MPI & OpenMP”, Tata McGraw-Hill, New Delhi, 2003
3. Kai Hwang, “Advanced Computer Architecture” Tata McGraw-Hill, New Delhi, 2003

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2060543: ARTIFICIAL INTELLIGENCE (Professional Elective-I)

III Year B.Tech. DS II – Sem.

L	T	P	C
3	0	0	3

Prerequisites:

- A course on “Data Structures”
- A course on “Design and Analysis of Algorithms”
- A course on “Probability & Statistics”

Course Objectives:

- To learn the distinction between optimal reasoning Vs. human like reasoning
- To understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
- To learn different knowledge representation techniques.
- To understand the applications of AI, namely game playing, theorem proving, and machine learning.

Course Outcomes: The students will be able to:

- Frame an efficient problem space for a problem expressed in natural language.
- Finalize a search algorithm for a problem and estimate its time and space complexities.
- Possess the skill for representing knowledge using the appropriate technique for a given problem.
- Apply AI techniques to solve problems of game playing, and machine learning.

UNIT-I

Artificial Intelligence: What is AI, Foundations and History of AI.

Intelligent Agents: Introduction, how Agents Should Act, Structure of Intelligent Agents, Agent programs, Simple reflex agents, Goal based agents, Utility based agents, Environments and Environment programs.

Problem Solving by Search: Problem-Solving Agents, Formulating Problems, Example Problems, Searching for Solutions, Search Strategies (Breadth-first search, Uniform cost search, Depth-First
Search, Iterative deepening Depth-First search, Bidirectional search).

UNIT-II

Informed Search Methods: Best-First Search, Heuristic Functions, Memory Bounded Search, Iterative Improvement Algorithms.

Game Playing: Introduction, Games as Search Problems, Perfect Decisions in Two-Person Games, Imperfect Decisions, Alpha-Beta Pruning, Games That Include an Element of Chance, State-of-the- Art Game Programs.

UNIT–III

Knowledge and Reasoning: A Knowledge-Based Agent, The Wumpus World Environment, Representation, Reasoning, and Logic, Prepositional Logic, An Agent for the Wumpus World. **First-Order Logic**: Syntax and Semantics, Extensions and Notational Variations, Using First-

Order Logic, Logical Agents for the Wumpus World, A Simple Reflex Agent, Representing Change in the World Building a Knowledge Base: Properties of Good and Bad Knowledge Bases, Knowledge Engineering, The Electronic Circuits Domain, General Ontology, **Application:** The Grocery Shopping World.

UNIT–IV

Inference in First-Order Logic: Inference Rules Involving Quantifiers, An Example Proof, Generalized Modus Ponens, Forward and Backward Chaining, Resolution: A Complete Inference Procedure, Completeness of resolution.

Logical Reasoning Systems: Introduction, Indexing, Retrieval, and Unification, Logic Programming Systems, Theorem Provers, Forward-Chaining Production Systems, Frame Systems and Semantic Networks, Description Logics, Managing Retractions, Assumptions, and Explanations.

UNIT-V

Planning: A Simple Planning Agent, From Problem Solving to Planning, Planning in Situation Calculus, Basic Representations for Planning, A Partial-Order Planning Example, A Partial-Order Planning Algorithm, Knowledge Engineering for Planning.

Practical Planning: Practical Planners, Hierarchical Decomposition, Analysis of Hierarchical Decomposition, Resource Constraints.

TEXT BOOKS:

2. Artificial Intelligence A Modern Approach, Stuart Russell and Peter Norvig, 3rd Edition, Pearson Education.

REFERENCES:

4. Artificial Intelligence, E.Rich and K.Knight, , 3rd Edition, TMH
5. Artificial Intelligence, Patrick Henny Winston, 3rd Edition, Pearson Education.
6. Artificial Intelligence, ShivaniGoel, Pearson Education.
7. Artificial Intelligence and Expert systems – Patterson, Pearson Education

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2060582: WEB TECHNOLOGIES LAB

III Year B.Tech. DS II – Sem.	L	T	P	C
	0	0	3	1.5

Prerequisites:

- A course on “Java Programming”.
- A course on “Data Base Management Systems”.

Course Objectives:

- To introduce PHP Language for server side scripting
- To introduce XML and Processing of XML data
- To introduce server side programming with java servlets and JSP
- To introduce client side scripting with java scripts

Course Outcomes: The students should be able to

- Gain knowledge of client side scripting validation of forms and AJAX programming
- Understand server side scripting with PHP language
- Understand XML and how to parse and use XML data with java.
- Do server side programming with java servlets and JSP.

List of Experiments

1. Write a PHP script to print prime numbers between 1-50.
2. PHP script to
   a. Find the length of a string.
   b. Count no of words in a string.
   c. Reverse a string.
   d. Search for a specific string.
3. Write a PHP script to merge two arrays and sort them as numbers, in descending order.
4. Write a PHP script that reads data from one file and write into another file.
5. Develop static pages (using Only HTML) of an online book store. The pages should resemble: www.amazon.com. The website should consist the following pages.
   a. Home page
   b. Registration and user Login
   c. User Profile Page
   d. Books catalog
   e. Shopping Cart
   f. Payment By credit card
   g. Order Conformation
6. Validate the Registration, user login, user profile and payment by credit card pages using
7. JavaScript.
8. Create and save an XML document on the server, which contains 10 users information. Write a program, which takes User Id as an input and returns the user details by taking the user information from the XML document.
9. Install TOMCAT web server. Convert the static web pages of assignments 2 into dynamic web pages using servlets and cookies. Hint: Users information (user id, password, credit

card number) would be stored in web.xml. Each user should have a separate Shopping Cart.

10. Redo the previous task using JSP by converting the static web pages of assignments 2 into dynamic web pages. Create a database with user information and books information. The books catalogue should be dynamically loaded from the database. Follow the MVC architecture while doing the website.

TEXT BOOK:

1. WEB TECHNOLOGIES: A Computer Science Perspective, Jeffrey C. Jackson, Pearson Education

REFERENCES:

1. Deitel H.M. and Deitel P.J., “Internet and World Wide Web How to program”, Pearson International, 2012, 4th Edition.
2. J2EE: The complete Reference By James Keogh, McGraw-Hill
3. Bai and Ekedhi, The Web Warrior Guide to Web Programming, Thomson
4. Paul Dietel and Harvey Deitel,” Java How to Program”, Prentice Hall of India, 8th Edition
5. Web technologies, Black Book, Dreamtech press.
6. Gopalan N.P. and Akilandeswari J., “Web Technology”, Prentice Hall of India

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2066772:R-PROGRAMMING LAB

III Year B.Tech. DS II – Sem.	**L**	**T**	**P**	**C**
	0	**0**	**3**	**1.5**

Prerequisites:

- A course on “Java Programming”.
- A course on “Data Base Management Systems”.

Course Objectives:

- To understand the R Programming Language.
- Exposure on solving of data science problems.
- Understand Classification and Regression Modelling.

Course Outcomes: The students should be able to

- Work with data science using R Programming environment.
- Implement various statistical concepts like linear and logistic regression.
- Perform Classification and Clustering over a given data set.

List of Experiments

1. R AS CALCULATOR APPLICATION

a. Using with and without R objects on console
b. Using mathematical functions on console
c. Write an R script, to create R objects for calculator application and save in a specified location in disk

2. DESCRIPTIVE STATISTICS IN R

a. Write an R script to find basic descriptive statistics using summary, str, quartile function on mtcars& cars datasets.
b. Write an R script to find subset of dataset by using subset (), aggregate () functions on iris dataset.

3. READING AND WRITING DIFFERENT TYPES OF DATASETS

a. Reading different types of data sets (.txt, .csv) from web and disk and writing in file in specific disk location.
b. Reading Excel data sheet in R.

4. VISUALIZATIONS

a. Find the data distributions using box and scatter plot.
b. Find the outliers using plot.
c. Plot the histogram, bar chart and pie chart on sample data.

5. CORRELATION AND COVARIANCE

a. Find the correlation matrix.
b. Plot the correlation plot on dataset and visualize giving an overview of relationships among data on iris data.
c. Analysis of covariance: variance (ANOVA), if data have categorical variables on iris data.

6. REGRESSION MODEL

a. Import a data from web storage. Name the dataset and perform Logistic Regression to find out relation between variables the model. Also check the model is fit or not [require (foreign), require(MASS)]

7. CLASSIFICATION MODEL

a. Install relevant package for classification.
b. Choose classifier for classification problem.
c. Evaluate the performance of classifier.

8. CLUSTERING MODEL

a. Clustering algorithms for unsupervised classification.
b. Plot the cluster data using R visualizations.

REFERENCES:

1. Yanchang Zhao, “R and Data Mining: Examples and Case Studies”, Elsevier, 1st Edition, 2012

Web References:

1. http://www.r-bloggers.com/how-to-perform-a-logistic-regression-in-r/
2. http://www.ats.ucla.edu/stat/r/dae/rreg.htm
3. http://www.coastal.edu/kingw/statistics/R-tutorials/logistic.html
4. http://www.ats.ucla.edu/stat/r/data/binary.csv

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2060075: ADVANCED ENGLISH LANGUAGE COMMUNICATION SKILLS LABORATORY

III Year B.Tech. DS II – Sem.

L	T	P	C
0	0	3	1.5

INTRODUCTION:

The introduction of the Advanced Communication Skills Lab is considered essential at 3rd year level. At this stage, the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalized context.

The proposed course should be a laboratory course to enable students to use 'good' English and perform the following:

- Gathering ideas and information to organize ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations. Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.
- Taking part in social and professional communication**.**

OBJECTIVES:

This Lab focuses on using multi-media instruction for language development to meet the following targets:

To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.

Further, they would be required to communicate their ideas relevantly and coherently in writing.

To prepare all the students for their placements.

SYLLABUS:

The following course content to conduct the activities is prescribed for the Advanced English Communication Skills (AECS) Lab:

Activities on Fundamentals of Inter-personal Communication and Building Vocabulary - Starting a conversation – responding appropriately and relevantly – using the right body language – Role Play in different situations & Discourse Skills- using visuals - Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations & usage of vocabulary.

Activities on Reading Comprehension –General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading&

effective googling.

Activities on Writing Skills – Structure and presentation of different types of writing – letter writing/Resume writing/ e-correspondence/Technical report writing/ – planning for writing – improving one's writing. Activities on Presentation Skills – Oral presentations (individual and group) through JAM sessions/seminars/PPTs and written presentations through posters/projects/reports/emails/assignments etc.

Activities on Group Discussion and Interview Skills – Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation- Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference & video-conference and Mock Interviews.

TEXT BOOKS:

1. Effective Technical Communication by M Asharaf Rizvi. McGraw Hill Education (India) Pvt. Ltd. 2nd Edition
2. Academic Writing: A Handbook for International Students by Stephen Bailey, Routledge, 5th Edition.

REFERENCES:

1. Learn Correct English – A Book of Grammar, Usage and Composition by Shiv K. Kumar and Hemalatha Nagarajan. Pearson 2007
2. Professional Communication by Aruna Koneru, McGraw Hill Education (India) Pvt. Ltd, 2016.
3. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
4. Technical Communication by Paul V. Anderson. 2007. Cengage Learning pvt. Ltd. New Delhi.
5. English Vocabulary in Use series, Cambridge University Press 2008.
6. Handbook for Technical Communication by David A. McMurrey & Joanne Buckley. 2012. Cengage Learning.
7. Communication Skills by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.
8. Job Hunting by ColmDownes, Cambridge University Press 2008.
9. English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hill 2009.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2060025: PROFESSIONAL ETHICS

III Year B.Tech. DS II – Sem.

L	T	P	C
0	0	3	1.5

Prerequisite: Nil

Course Objectives:

- To make the students understand the types of roles they are expected to play in the society as practitioners of the civil engineering profession
- To develop some ideas of the legal and practical aspects of their profession.

Course Outcomes:

- To understand the importance of professional practice, Law and Ethics in their personal lives and professional careers.
- To learn the rights and responsibilities as an employee, team member and a global citizen

UNIT – I

Professional Practice and Ethics: Definition of Ethics, Professional Ethics - Engineering Ethics, Personal Ethics; Code of Ethics - Profession, Professionalism, Professional Responsibility, Conflict of Interest, Gift Vs Bribery, Environmental breaches, Negligence, Deficiencies in state-of-the-art; Vigil Mechanism, Whistle blowing, protected disclosures. Introduction to GST- Various Roles of Various Stake holders.

UNIT - II

Law of Contract: Nature of Contract and Essential elements of valid contract, Offer and Acceptance, Consideration, Capacity to contract and Free Consent, Legality of Object. Unlawful and illegal agreements, Contingent Contracts, Performance and discharge of Contracts, Remedies for breach of contract. **Contracts-II:** Indemnity and guarantee, Contract of Agency, Sale of goods Act - 1930: General Principles, Conditions & Warranties, Performance of Contract of Sale.

UNIT – III

Arbitration, Conciliation and ADR (Alternative Dispute Resolution) system: Arbitration – meaning, scope and types – distinction between laws of 1940 and 1996; UNCITRAL model law – Arbitration and expert determination; Extent of judicial intervention; International commercial arbitration; Arbitration agreements – essential and kinds, validity, reference and interim measures by court; Arbitration tribunal appointment, challenge, jurisdiction of arbitral tribunal, powers, grounds of challenge, procedure and court assistance; Distinction between conciliation, negotiation, mediation and arbitration, confidentiality, resort to judicial proceedings, costs; Dispute Resolution Boards; Lok Adalats.

UNIT – IV

Engagement of Labour and Labour & other construction-related Laws: Role of Labour in Civil Engineering; Methods of engaging labour- on rolls, labour sub-contract, piece rate work; Industrial Disputes Act, 1947; Collective bargaining; Industrial Employment (Standing Orders) Act, 1946; Workmen's Compensation Act, 1923; Building & Other - Construction Workers (regulation of employment and conditions of service) Act (1996) and Rules (1998); RERA Act 2017, NBC 2017.

UNIT - V

Law relating to Intellectual property: Introduction – meaning of intellectual property, main forms of IP, Copyright, Trademarks, Patents and Designs, Secrets; Law relating to Copyright in India including

Historical evolution of Copy Rights Act, 1957, Meaning of copyright – computer programs, Ownership of copyrights and assignment, Criteria of infringement, Piracy in Internet – Remedies and procedures in India; Law relating to Patents under Patents Act, 1970

TEXT BOOKS:

1. Professional Ethics: R. Subramanian, Oxford University Press, 2015.
2. Ravinder Kaur, Legal Aspects of Business, 4e, Cengage Learning, 2016.

REFERENCES:

1. Wadhera (2004), Intellectual Property Rights, Universal Law Publishing Co. RERA Act, 2017
2. T. Ramappa (2010), Intellectual Property Rights Law in India, Asia Law House.
O.P. Malhotra, Law of Industr

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

B.Tech – C S E (Data Science)

R20 – IV – I (Course Structure and Syllabus)
Applicable From 2020-21 Admitted Batch

IV Year – I Semester

S. No.	Course Code	Course Name	Course Area	Periods per week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2070011	Fundamentals of Management	HSMC	3	0	0	3	30	70	100
2	2076703	Business intelligence	PC	3	0	0	3	30	70	100
3	2070558	Deep Learning	PC	3	0	0	3	30	70	100
4		Professional Elective II	PE	3	0	0	3	30	70	100
5		Professional Elective III	PE	3	0	0	3	30	70	100
6		Open Elective III	OE	3	0	0	3	30	70	100
7	2076773	Business intelligence Lab	PC	0	0	3	1	30	70	100
8	2076675	Deep learning lab	PC	0	0	3	1	30	70	100
9	2070585	Industry Oriented Mini Project/ Summer Internship*	PS	0	0	4	2	30	70	100
10	2070586	Project Stage-I	PS	0	0	6	3	30	70	100
TOTAL				**18**	**0**	**16**	**26**	**300**	**700**	**1000**

2070011: FUNDAMENTALS OF MANAGEMENT

B.Tech. IV Year - I Sem **L T P C**

3 0 0 3

Prerequisites:

Course Objectives:

- To understand the Management Concepts, applications of Concepts in Practical aspects of business and development of Managerial Skills for Engineers.

Course Outcomes: The students will be able to:

- The students understand the significance of Management in their Profession. The various Management Functions like Planning, Organizing, Staffing, Leading, Motivation and Control aspects are learnt in this course. The students can explore the Management Practices in their domain area.

UNIT-I

Introduction to Management: Definition, Nature and Scope, Functions, Managerial Roles, Levels of Management, Managerial Skills, Challenges of Management; Evolution of Management- Classical Approach- Scientific and Administrative Management; The Behavioral approach; The Quantitative approach; The Systems Approach; Contingency Approach, IT Approach.

UNIT-II

Planning and Decision Making: General Framework for Planning - Planning Process, Types of Plans, Management by Objectives; Production Planning and Control. Decision making and Problem Solving - Programmed and Non Programmed Decisions, Steps in Problem Solving and Decision Making; Bounded Rationality and Influences on Decision Making; Group Problem Solving and Decision Making, Creativity and Innovation in Managerial Work.

UNIT–III

Organization and HRM: Principles of Organization: Organizational Design & Organizational Structures; Departmentalization, Delegation; Empowerment, Centralization, Decentralization, Recentralization; Organizational Culture; Organizational Climate and Organizational Change.

Human Resource Management & Business Strategy: Job Satisfaction, Job Enrichment, Job Enlargement, Talent Management, Strategic Human Resource Planning; Recruitment and Selection; Training and Development; Performance Appraisal.

UNIT–IV

Leading and Motivation: Leadership, Power and Authority, Leadership Styles; Behavioral Leadership, Situational Leadership, Leadership Skills, Leader as Mentor and Coach, Leadership during adversity and Crisis; Handling Employee and Customer Complaints, Team Leadership.

Motivation - Types of Motivation; Relationship between Motivation, Performance and Engagement, Content Motivational Theories - Needs Hierarchy Theory, Two Factor Theory, Theory X and Theory Y.

UNIT-V

Controlling: Control, Types and Strategies for Control, Steps in Control Process, Budgetary and Non-Budgetary Controls. Characteristics of Effective Controls, Establishing control systems,
Control frequency and Methods

TEXT BOOKS:

1. Management Essentials, Andrew DuBrin, 9e, Cengage Learning, 2012.
2. Fundamentals of Management, Stephen P. Robbins, Pearson Education, 2009.

REFERENCES:

1. Essentials of Management, Koontz Kleihrich, Tata Mc - Graw Hill.
2. Management Fundamentals, Robert N Lussier, 5e, Cengage Learning, 2013.
3. Industrial Engineering and Management: Including Production Management, T.R. Banga, S.C. Sharma, Khanna Publishers

2076704: BUSINESS INTELLIGENCE

B.Tech. IV Year - I Sem	L	T	P	C
	3	0	0	3

Prerequisites:

Course Objectives:

- Be exposed with the basic rudiments of business intelligence system
- Understand the modeling aspects behind Business Intelligence
- Understand of the business intelligence life cycle and the techniques used in it
- Be exposed with different data analysis tools and techniques

Course Outcomes: The students will be able to**:**

- Explain the fundamentals of business intelligence.
- Link data mining with business intelligence.
- Apply various modeling techniques.
- Explain the data analysis and knowledge delivery stages.
- Apply business intelligence methods to various situations.
- Decide on appropriate technique.

UNIT1: Business Intelligence:

Business intelligence: Effective and timely decisions, Data, information and knowledge, The role of mathematical models, Business intelligence architectures, Ethics and business intelligence Decision support systems: Definition of system, Representation of the decision-making process, Evolution of information systems, Definition of decision support system, Development of a decision support system

UNIT II: Mathematical models for decision making:

Structure of mathematical models, development of a model, Classes of models Data mining: Definition of data mining, Representation of input data, Data mining process, Analysis methodologies, Data preparation: Data validation, Data transformation, Data reduction.

UNIT III: Business intelligence applications

Marketing models: Relational marketing, Sales force management, Logistic and production models: Supply chain optimization, Optimization models for logistics planning, Revenue management systems. Data envelopment analysis: Efficiency measures, Efficient frontier, The CCR model, Identification of good operating practices.

UNIT-IV: Knowledge Management:

Introduction to Knowledge Management ,Organizational Learning and Transformation, Knowledge Management Activities, Approaches to Knowledge Management, Information Technology (IT) In Knowledge Management, Knowledge Management Systems Implementation, Roles of People in Knowledge Management Artificial Intelligence and Expert Systems: Concepts and Definitions of Artificial Intelligence, Artificial Intelligence Versus Natural Intelligence, Basic Concepts of Expert Systems, Applications of Expert Systems, Structure of Expert Systems, Knowledge Engineering, Development of Expert Systems

UNIT-V: Future of Business Intelligence

Emerging Technologies, Machine Learning, Predicting the Future with the help of Data Analysis, BI Search & Text Analytics – Advanced Visualization – Rich Report, Future beyond Technology.

TEXT BOOK:

1. Business Intelligence: Data Mining and Optimization for Decision Making by Carlo Vercellis ,Wiley India Publications.
2. Efraim Turban, Ramesh Sharda, Dursun Delen, "Decision Support and Business Intelligence Systems", 9th Edition, Pearson 2013.

REFERENCES:

1. P. N. Tan, M. Steinbach, Vipin Kumar, "Introduction to Data Mining", Pearson Education
2. Michael Berry and Gordon Linoff "Data Mining Techniques", 2nd Edition Wiley Publications.
3. Michael Berry and Gordon Linoff "Mastering Data Mining- Art & science of CRM", Wiley Student Edition
4. Vikram Pudi & Radha Krishna, "Data Mining", Oxford Higher Education.

2070558: DEEP LEARNING

B.Tech. IV Year - I Sem **L T P C**

3 0 0 3

Prerequisites: Machine Learning, Probability & Statistics

Course Objectives:

- To introduce the foundations of Artificial Neural Networks
- To acquire the knowledge on Deep Learning Concepts
- To gain knowledge to apply optimization strategies.

Course Outcomes: The students will be able to:

- Understand the concepts of Neural Networks
- Select the Learning Networks in modeling real world systems
- Use an efficient algorithm for Deep Models
- Apply optimization strategies for large scale applications

UNIT-I

Artificial Neural Networks Introduction, Basic models of ANN, important terminologies, Supervised Learning Network, Perceptron Networks, Adaptive Linear Neuron, Back-propagation Network. Associative Memory Networks. Training Algorithms for pattern association, BAM and Hopfield Networks.

UNIT-II

Unsupervised Learning Network-Introduction, Fixed Weight Competitive Nets, Maxnet, Hamming Network, Kohonen Self-Organizing Feature Maps, Learning Vector Quantization, Counter Propagation Networks, Adaptive Resonance Theory Networks. Special Networks-Introduction to various networks.

UNIT–III

Introduction to Deep Learning, Historical Trends in Deep learning, Deep Feed – forward networks, Gradient-Based learning, Hidden Units, Architecture Design, Backk-Propagation and Other Differentiation Algorithms.

UNIT – IV

Regularization for Deep Learning: Parameter norm Penalties, Norm Penalties as Constrained Optimization, Regularization and Under-Constrained Problems, Dataset Augmentation, Noise Robustness, Semi-Supervised learning, Multi-task learning Early Stopping, Parameter Typing and Parameter Sharing, Sparse Representations, Bagging and other Ensemble Methods, Dropout, Adversarial Training, Tangent Distance, tangent Prop and Manifold, Tangent Classifier.

UNIT –V

Optimization for Train Deep Models: Challenges in Neural Network Optimization, Basic Algorithms, Parameter Initialization Strategies, Algorithms with Adaptive Learning Rates, Approximate Second Order Methods, Optimization Strategies and Meta-Algorithms Applications: large Scale Deep Learning, Computer Vision, Speech Recognition, Natural Language Processing.

TEXT BOOKS:

1.Deep Learning: An MIT Press Book By Ian Goodfellow and Yoshua Bengio and Aaron Courville
2. Neural Networks and Learning Machines, Simon Haykin, 3rd Edition, Pearson Prentice Hall.

REFERENCES:

1. Bishop. C.M., Pattern Recognition and Machine Learning, Springer, 2006,
2. Yegnanarayana, B., Artificial Neural Networks PHI Learning Pvt. Ltd, 2009
3. Golub, G.H., and Van Loan, C.F., Matrix Computations, JHU Press, 2013.
4. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw Hill Education, 2004.

2070545: LINUX PROGRAMMING (Professional Elective-II)

B.Tech. IV Year - I Sem	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Prerequisites:

- A course on "Operating Systems".
- A course on "Computer Organization"

Course Objectives:

- To teach principles of operating system including File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking Commands, Basic Linux commands, Scripts and filters.
- To familiarize fundamentals of the Bourne again shell (bash), shell programming, pipes, input and output redirection Control structures, arithmetic in shell interrupt processing, functions, debugging shell scripts.
- To facilitate students in understanding Inter process communication.
- To facilitate students in understanding semaphore, shared memory and process.

Course Outcomes: The students will be able to**:**

- Use various Linux commands that are used to manipulate system operations at adminlevel and a prerequisite to pursue job as a Network administrator.
- Write Shell Programming using Linux commands.
- Design and write application to manipulate internal kernel level Linux File System.
- Develop IPC-API's that can be used to control various processes for synchronization.
- Develop Network Programming that allows applications to make efficient use of resources available on different machines in a network.

UNIT-I

INTRODUCTION TO LINUX AND LINUX UTILITIES: A brief history of LINUX, architecture of LINUX, features of LINUX, introduction to vi editor. Linux commands- PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin.Text Processing utilities and backup utilities , tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio**.**

UNIT-II

Introduction to Shells: Linux Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization. Filters: Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count Characters, Words or Lines, Comparing Files.

UNIT–III

Grep: Operation, grep Family, Searching for File Content. Sed :Scripts, Operation, Addresses, commands, Applications, grep and sed. UNIX FILE STRUCTURE: Introduction to UNIX file system, inode (Index Node), file descriptors, system calls and device drivers. File Management :File Structures, System Calls for File Management – create, open, close, read, write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir, closedir, mkdir, rmdir, umask.

UNIT–IV

PROCESS AND SIGNALS: Process, process identifiers, process structure: process table, viewing processes, system processes, process scheduling, starting new processes: waiting for a process, zombie processes, orphan process, fork, vfork, exit, wait, waitpid, exec, signals functions, unreliable signals, interrupted system calls, kill, raise, alarm, pause, abort, system,sleep functions, signal sets. File locking: creating lock files, locking regions, use of read and write with locking, competing locks, other lock commands, deadlocks.

UNIT-V

INTER PROCESS COMMUNICATION: Pipe, process pipes, the pipe call, parent and child processes, and named pipes: fifos, semaphores: semget, semop, semctl, message queues: msgget, msgsnd, msgrcv, msgctl, shared memory: shmget, shmat, shmdt, shmctl, ipc status commands. INTRODUCTION TO SOCKETS: Socket, socket connections - socket attributes, socket addresses, socket, connect, bind, listen, accept, socket communications.

TEXTBOOKS:

1. W. Richard. Stevens (2005), Advanced Programming in the UNIX Environment, 3rdedition, Pearson Education, New Delhi, India.
2. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg.Thomson

REFERENCES:

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. Advanced Programming in the UNIX environment, 2nd Edition, W.R.Stevens, Pearson Education.
3. UNIX Network Programming, W.R. Stevens, PHI. UNIX for Programmers and Users, 3rd Edition, Graham Glass, King Ables, Pearson Education

2070553: DISTRIBUTED SYSTEMS (Professional Elective-II)				
B.Tech. IV Year - I Sem.	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Prerequisites:

Course Objectives:

- To understand what and why a distributed system
- To understand theoretical concepts, namely, virtual time, agreement and consensusprotocols.
- To understand IPC, Group Communication & RPC Concepts.
- To understand the DFS and DSM Concepts.
- To understand the concepts of transaction in distributed environment and associatedconcepts, namely, concurrency control, deadlocks and error recovery.

Course Outcomes: The students will be able to:

- Able to comprehend and design a new distributed system with the desired features.
- Able to start literature survey leading to further research in any subarea.
- Able to develop new distributed applications.

UNIT-I

Characterization of Distributed Systems: Introduction, Examples of Distributed Systems Resource Sharing and the Web, Challenges. System Models: Introduction, Architectural Models, Fundamental Models.

UNIT-II

Time and Global States: Introduction, Clocks Events and Process States, Synchronizing Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed Debugging. **Coordination and Agreement:** Introduction, Distributed Mutual Exclusion, Elections, Multicast Communication, Consensus and Related Problems.

UNIT–III

Inter Process Communication: Introduction, The API for the Internet Protocols, External Data Representation and Marshalling, Client-Server Communication, Group Communication, Case Study: IPC in UNIX. Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI.

UNIT–IV

Distributed File Systems: Introduction, File Service Architecture, Case Study 1: Sun Network File System, Case Study 2: The Andrew File System. Name Services: Introduction, Name Services and the Domain Name System, Directory Services, Case Study of the Global Name Services.

Distributed Shared Memory: Introduction, Design and Implementation Issues, Sequential Consistency and IVY case study, Release Consistency, Munin Case Study, Other ConsistencyModels.

UNIT-V

Transactions and Concurrency Control: Introduction, Transactions, Nested Transactions, Locks, Optimistic Concurrency Control, Timestamp Ordering, Comparison of Methods for Concurrency Control. **Distributed Transactions:** Introduction, Flat and Nested Distributed Transactions, Atomic Commit Protocols, Concurrency Control in Distributed Transactions, Distributed Deadlocks, Transaction Recovery.

TEXT BOOKS:

1. Distributed Systems, Concepts and Design, George Coulouris, J Dollimore and Tim Kindberg, Pearson Education, 4th Edition, 2009.

REFERENCES:

1. Distributed Systems, Principles and Paradigms, Andrew S. Tanenbaum, Maarten Van Steen, 2nd Edition, PHI.
2. Distributed Systems, An Algorithm Approach, SukumarGhosh, Chapman & Hall/CRC,Taylor &Fransis Group, 2007.

2070547: CRYPTOGRAPHY AND NETWORK SECRITY (Professional Elective-II)

B.Tech. IV Year - I Sem	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Prerequisites: Basic concepts of Data communication and Computer Networks

Course Objectives:

- To impart knowledge on network security issues, services, goals and mechanisms.
- To analyze the security of communication systems, networks and protocols.
- To apply algorithms used for secure transactions in real world applications

Course Outcomes: The students should be able to

- Demonstrate the knowledge of cryptography and network security concepts andapplications.
- Understand and apply the concepts of symmetric encryption.
- Identify and investigate of Cryptographic Hash Functions.
- Understand the concepts of email security and PGP.
- Understand and apply web security mechanisms

UNIT - I

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Cryptography Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.

UNIT - II

Symmetric key Ciphers: Block Cipher principles, DES, AES, Blowfish, RC4, RC5, Block cipher operation, Stream ciphers, Asymmetric key Ciphers: Principles of public key cryptosystems, RSA algorithm, Elgamal Cryptography, Diffie-Hellman Key Exchange, Knapsack Algorithm.

UNIT-III

Cryptographic Hash Functions: Message Authentication, Secure Hash Algorithm (SHA512), Message authentication codes: Authentication requirements, HMAC, CMAC, Digital signatures, Elgamal Digital Signature Scheme. Key Management and Distribution: Symmetric Key Distribution Using Symmetric & Asymmetric Encryption, Distribution of Public Keys, Kerberos, X.509 Authentication Service, Public – Key Infrastructure

UNIT-IV

Email privacy: Pretty Good Privacy (PGP) and S/MIME. IP Security: Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

UNIT – V

Web Security: Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET). Intruders, Viruses and related threats, Firewall Design principles, Trusted Systems, Intrusion Detection Systems.

TEXT BOOKS:

1. Cryptography and Network Security by Atul Kahathe MC Graw Hill, 2nd edition.
2. Cryptography and Network Security by William Stallings 6th Edition, Pearson Education.

REFERENCE BOOKS:

1. Cryptography and Network Security by Behrouz A.Forouzan.
2. Applied Cryptography" by Bruce Schneier.

2070548: SOFTWARE PROJECT MANAGEMENT (Professional Elective-I)

B.Tech. IV Year - I Sem	L	T	P	C
	3	0	0	3

Prerequisites:

- A course on "Software Engineering".
- A course on "Business Economics and Financial Management".

Course Objectives:

- To acquire knowledge on software process management
- To acquire managerial skills for software project development
- To understand software economics

Course Outcomes: The students will be able to:

- Apply phases in the life cycle of software development
- Analyze the major and minor milestones, artifacts and metrics from management andtechnical perspective
- Design and develop software product using conventional and modern principles of software project management

UNIT-I

Software Process Maturity Software maturity Framework, Principles of Software Process Change, Software Process Assessment, The Initial Process, The Repeatable Process, The Defined Process, The Managed Process, The Optimizing Process. Process Reference Models Capability Maturity Model (CMM), CMMI, PCMM, PSP, TSP).

UNIT-II

Software Project Management Renaissance Conventional Software Management, Evolution of Software Economics, Improving Software Economics, The old way and the new way. Life-Cycle Phases and Process artifacts Engineering and Production stages, inception phase, elaboration phase, construction phase, transition phase, artifact sets, management artifacts, engineering artifacts and pragmatic artifacts, model-based software architectures.

UNIT–III

Workflows and Checkpoints of process Software process workflows, Iteration workflows, Major milestones, minor milestones, periodic status assessments. Process Planning Work breakdown structures, Planning guidelines, cost and schedule estimating process, iteration planning process, Pragmatic planning.

UNIT–IV

Project Organizations Line-of- business organizations, project organizations, evolution of organizations, process automation. Project Control and process instrumentation The seven-core metrics, management indicators, quality indicators, life-cycle expectations, Pragmatic software metrics, metrics automation.

UNIT-V

CCPDS-R Case Study and Future Software Project Management Practices Modern Project Profiles, Next-Generation software Economics, Modern Process Transitions.

TEXT BOOKS:

1. Managing the Software Process, Watts S. Humphrey, Pearson Education
2. Software Project Management, Walker Royce, Pearson Education

REFERENCES:

1. An Introduction to the Team Software Process, Watts S. Humphrey, Pearson Education,2000.
2. Process Improvement essentials, James R. Persse, O'Reilly, 2006
3. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, TMH, 2006.
4. Applied Software Project Management, Andrew Stellman& Jennifer Greene, O'Reilly,2006.
5. Head First PMP, Jennifer Greene & Andrew Stellman, O'Reilly, 2007
6. Software Engineering Project Management, Richard H. Thayer & Edward Yourdon, 2 ndedition, Wiley India, 2004.
7. Agile Project Management, Jim Highsmith, Pearson education, 2004.

2070549: WIRELESS SENSORNETWORKS (Professional Elective-III)

B.Tech. IV Year - I Sem	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Prerequisites:

Course Objectives:

- To understand the fundamentals of wireless sensor networks and its application to criticalreal time scenarios.
- To study the various protocols at various layers and its differences with traditionalprotocols.
- To understand the issues pertaining to sensor networks and the challenges involved inmanaging a sensor network.

Course Outcomes: The students will be able to:

- Understand the working of adhoc/sensor networks.
- Analyze of various critical parameters in deploying a WSN

UNIT-I

Introduction: Fundamentals of wireless communication technology, the electromagnetic spectrum radio propagation, characteristics of wireless channels, modulation techniques, multiple access techniques, wireless LANs, PANs, WANs, and MANs, Wireless Internet.

UNIT-II

Introduction to adhoc/sensor networks: Key definitions of adhoc/ sensor networks, unique constraints and challenges, advantages of ad-hoc/sensor network, driving applications, issues in adhoc wireless networks, issues in design of sensor network, sensor network architecture, data dissemination and gathering.

UNIT–III

MAC Protocols : Issues in designing MAC protocols for adhoc wireless networks, design goals, classification of MAC protocols, MAC protocols for sensor network, location discovery, quality, other issues, S-MAC, IEEE 802.15.4.

UNIT–IV

Routing Protocols: Issues in designing a routing protocol, classification of routing protocols, table-driven, on-demand, hybrid, flooding, hierarchical, and power aware routing protocols

UNIT-V

QoS and Energy Management : Issues and Challenges in providing QoS, classifications, MAC, network layer solutions, QoS frameworks, need for energy management, classification, battery, transmission power, and system power management schemes.

TEXT BOOKS:

1. C. Siva Ram Murthy, and B. S. Manoj, "AdHoc Wireless networks ", Pearson Education -2008.

REFERENCES:

1. Feng Zhao and Leonides Guibas, "Wireless sensor networks ", Elsevier publication - 2004.
2. Jochen Schiller, "Mobile Communications", Pearson Education, 2nd Edition, 2003.
3. William Stallings, "Wireless Communications and Networks ", Pearson Education - 2004

2070550: COGNITIVE COMPUTING (Professional Elective-III)

B.Tech. IV Year - I Sem	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Prerequisites: Probability and Statistics

Course Objectives:

- To provide an understanding of the central challenges in realizing aspects of human cognition.
- To provide a basic exposition to the goals and methods of human cognition.
- To develop algorithms that use AI and machine learning along with human interaction and feedback to help humans make choices/decisions.
- To support human reasoning by evaluating data in context and presenting relevantfindings along with the evidence that justifies the answers.

Course Outcomes: The students will be able to:

- Understand what cognitive computing is, and how it differs from traditional approaches.
- Plan and use the primary tools associated with cognitive computing.
- Plan and execute a project that leverages cognitive computing.
- Understand and develop the business implications of cognitive computing.

UNIT-I

Introduction to Cognitive Science: Understanding Cognition, IBM's Watson, Design for Human Cognition, Augmented Intelligence, Cognition Modeling Paradigms: Declarative/ logic-based Computational cognitive modeling, connectionist models of cognition, Bayesian models ofcognition, a dynamical systems approach to cognition.

UNIT-II

Cognitive Models of memory and language, computational models of episodic and semanticmemory, modeling psycholinguistics.

UNIT–III

Cognitive Modeling: modeling the interaction of language, memory and learning, Modeling selectaspects of cognition classical models of rationality, symbolic reasoning and decision making

UNIT IV

Formal models of inductive generalization, causality, categorization and similarity, the role of analogy in problem solving, Cognitive Development Child concept acquisition. Cognition and Artificial cognitive architectures such as ACT-R, SOAR, OpenCog, CopyCat, Memory Networks.

UNIT V

DeepQA Architecture, Unstructured Information Management Architecture (UIMA), Structured Knowledge, Business Implications, Building Cognitive Applications, Application of Cognitive Computing and Systems.

TEXT BOOKS:

1. The Cambridge Handbook of Computational Psychology by Ron Sun (ed.), Cambridge University Press.
2. Formal Approaches in Categorization by Emmanuel M. Pothos, Andy J. Wills, Cambridge University Press.

REFERENCES:

1. Judith S. Hurwitz, Marcia Kaufman, Adrian Bowles Cognitive Computing and Big Data Analytics, Wiley
2. Vijay V Raghavan, Venkat N. Gudivada, Venu Govindaraju, Cognitive Computing: Theoryand

2070551: COMPUTER FORENSICS (Professional Elective-III)

B.Tech. IV Year - I Sem	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Prerequisites:

Course Objectives:

- To learn computer forensics
- To become familiar with forensics tools
- To learn to analyze and validate forensics data

Course Outcomes: The students will be able to:

- Understand the basics of computer forensics
- Apply a number of different computer forensic tools to a given scenario
- Analyze and validate forensics data
- Identify the vulnerabilities in a given network infrastructure
- Implement real-world hacking techniques to test system security

UNIT-IINTRODUCTION TO COMPUTER FORENSICS

Introduction to Traditional Computer Crime, Traditional problems associated with Computer Crime. Introduction to Identity Theft & Identity Fraud. Types of CF techniques - Incident and incident response methodology - Forensic duplication and investigation. Preparation for IR: Creating response tool kit and IR team. - Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition.

UNIT-IIEVIDENCE COLLECTION AND FORENSICS TOOLS

Processing Crime and Incident Scenes – Working with Windows and DOS Systems. Current Computer Forensics Tools: Software/ Hardware Tools.

UNIT–IIIANALYSIS AND VALIDATION

Validating Forensics Data – Data Hiding Techniques – Performing Remote Acquisition – Network Forensics – Email Investigations – Cell Phone and Mobile Devices Forensics

UNIT–IVETHICAL HACKING

Introduction to Ethical Hacking - Footprinting and Reconnaissance - Scanning Networks - Enumeration - System Hacking - Malware Threats - Sniffing

UNIT-VETHICAL HACKING IN WEB

Social Engineering - Denial of Service - Session Hijacking - Hacking Web servers - Hacking Web Applications – SQL Injection - Hacking Wireless Networks - Hacking Mobile Platforms.

TEXT BOOS:

1. Bill Nelson, Amelia Phillips, Frank Enfinger, Christopher Steuart, ―Computer Forensicsand Investigations‖, Cengage Learning, India Edition, 2016.
2. CEH official Certfied Ethical Hacking Review Guide, Wiley India Edition, 2015.

REFERENCES:

1. John R.Vacca, ―Computer Forensics‖, Cengage Learning, 2005
2. MarjieT.Britz, ―Computer Forensics and Cyber Crime‖: An Introduction‖, 3rd Edition, Prentice Hall, 2013.
3. AnkitFadia ― Ethical Hacking‖ Second Edition, Macmillan India Ltd, 2006
4. Kenneth C.Brancik ―Insider Computer Fraud‖ Auerbach Publications Taylor & Francis Group– 2008

2076742: IMAGE AND VIDEO PROCESSING (Professional Elective-III)

B.Tech. IV Year - I Sem

L	T	P	C
3	0	0	3

Prerequisites:

Course Objectives:

- To introduce fundamentals of digital image processing and study image transforms
- To demonstrate digital image processing techniques in spatial and frequency domains
- To study and compare various image compression algorithms
- To study advanced image analysis methods: image segmentation, morphological image processing, & image restoration

UNIT-I:

FUNDAMENTALS OF IMAGE PROCESSING: Digital Image Fundamentals, Basic steps of Image Processing System, Sampling and Quantization of an image, relationship between pixels, Imaging Geometry.

IMAGE TRANSFORMS: 2 D- Discrete Fourier Transform, Discrete Cosine Transform (DCT), Haar Transform, Hadamard Transform, Hoteling Transform and slant transform.

UNIT-II:

IMAGE ENHANCEMENT: Spatial domain methods: Histogram processing, Fundamentals of Spatial filtering, smoothing spatial filters, Sharpening spatial filters.

FREQUENCY DOMAIN METHODS: Basics of filtering in frequency domain, image smoothing, image sharpening, Selective filtering.

UNIT-III:

IMAGE SEGMENTATION: Segmentation concepts, Point, Line and Edge Detection, Edge Linkingusing Hough Transform, Thresholding, Region Based segmentation.

WAVELET BASED IMAGE PROCESSING: Introduction to wavelet Transform, Continuous wavelet Transform, Discrete wavelet Transform, Filter banks, Wavelet based image compression.

UNIT-IV:

IMAGE COMPRESSION: Image compression fundamentals - Coding Redundancy, Spatial and Temporal redundancy, Compression models: Lossy and Lossless, Huffman coding, Arithmeticcoding, LZW coding, Run length coding, Bit plane coding, Transform coding, Predictive coding,JPEG 2000 Standards.

UNIT-V:

IMAGE RESTORATION: Image Restoration Degradation model, Algebraic approach to restoration, Inverse Filtering, Least Mean square filters.

MORPHOLOGICAL IMAGE PROCESSING: Dilation and Erosion, Opening and closing, the hit or miss Transformation, Overview of Digital Image Watermarking Methods.

TEXTBOOKS:

1. Digital Image Processing- Rafael C. Gonzalez and Richard E.Woods, 3rd Edition, Pearson,2008.

REFERENCES:

2. Digital Image Processing-William K.Pratt, 3rdEdition, John Willey,2004.
3. Digital Image Processing using MATLAB - Rafael C. Gonzalez, Richard E.Woods andSteven L.Edding 2nd, TMH.2010.
4. Digital Image Processing and Computer Vision-Somka,Hlavac,Boyl,CengageLearning,2008
5. Introduction to image Processing and Analysis – John C. Russ, J. Christian Russ,CRCPress, 2010.
6. Digital Image Processing- S.Jayaraman, S Esakkirajan, T Veerakumar, TMH, 2010.

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

- Acquire, represent the digital image and transforms.
- Apply various intensity-based image processing techniques.
- Apply various pixel position-based image processing techniques

2076773: **BUSINESS INTELLIGENCE LAB**

B.Tech. IV Year - I Sem	**L**	**T**	**P**	**C**
	0	**0**	**2**	**1**

Prerequisites:

Course Objectives:

- Introduce the concepts and components of Business Intelligence (BI)
- Evaluate the technologies that make up BI (data warehousing, OLAP)
- Define how BI will help an organization and whether it will help yours
- Identify the technological architecture that makes up BI systems
- Plan the implementation of a BI system

Course Outcomes: The students will be able to:

- Identify sources of Data for mining and perform data exploration
- Organize and prepare the data needed for data mining algorithms in terms of attributesand class inputs, training, validating, and testing files.
- Implement the appropriate data mining methods like classification, clustering or association mining on large data sets using open source tools like WEKA
- Implement various data mining algorithms from scratch using languages like Python/ Java etc.
- Evaluate and compare performance of some available BI packages
- Apply BI to solve practical problems : Analyze the problem domain, use the data collected in enterprise apply the appropriate data mining technique, interpret and visualize the results and provide decision support.

LIST OF EXPERIMENTS:

1. Import the legacy data from different sources such as (Excel , SqlServer, Oracle etc.) and load in the target system. (You can download sample database such as Adventureworks, Northwind, foodmart etc.)
2. Perform the Extraction Transformation and Loading (ETL) process to construct the database in the Sqlserver.
3. a. Create the Data staging area for the selected database.
   b. Create the cube with suitable dimension and fact tables based on ROLAP, MOLAP and HOLAP model.
4. a.Create the ETL map and setup the schedule for execution.
   b. Execute the MDX queries to extract the data from the Datawarehouse.
5. a. Import the Datawarehouse data in Microsoft Excel and create the Pivot table and Pivot Chart.
   b. Import the cube in Microsoft Excel and create the Pivot table and Pivot Chart to perform data analysis.
6. Apply the what – if Analysis for data visualization. Design and generate necessaryreports based on the data warehouse data.
7. Perform the data classification using classification algorithm.
8. Perform the data clustering using clustering algorithm.
9. Perform the Linear regression on the given data warehouse data.
10. Perform the logistic regression on the given data warehouse data.

The BI tools such as Tableau / Power BI / BIRT / R / Excel or any other can be used.

2076675: **DEEP LEARNING LAB**

IV Year B.Tech. CSD I – Sem.	**L**	**T**	**P**	**C**
	0	**0**	**2**	**1**

Prerequisites:

Course Objectives:

- To Build the Foundation of Deep Learning.
- To Understand How to Build the Neural Network.
- To enable students to develop successful machine learning concepts.

Course Outcomes: The students will be able to:

- Learn the Fundamental Principles of Deep Learning.
- Identify the Deep Learning Algorithms for Various Types of Learning Tasks in various domains.
- Implement Deep Learning Algorithms and Solve Real-world problems.

LIST OF EXPERIMENTS:

1. Setting up the Spyder IDE Environment and Executing a Python Program
2. Installing Keras, Tensorflow and Pytorch libraries and making use of them
3. Implement Simple Programs like vector addition in TensorFlow.
4. Implement a simple problem like regression model in Keras.
5. Implement a perceptron in TensorFlow/Keras Environment.
6. Implement a Feed-Forward Network in TensorFlow/Keras.
7. Applying the Convolution Neural Network on computer vision problems
8. Image classification on MNIST dataset (CNN model with Fully connected layer)
9. Applying the Deep Learning Models in the field of Natural Language Processing
10. Train a sentiment analysis model on IMDB dataset, use RNN layers with LSTM/GRU notes
11. Applying the Autoencoder algorithms for encoding the real-world data

TEXT BOOKS:

1. Deep Learning by Ian Goodfellow, Yoshua Bengio and Aaron Courville, MIT Press.
2. The Elements of Statistical Learning by T. Hastie, R. Tibshirani, and J. Friedman, Springer.

REFERENCES:

1. Bishop, C.M., Pattern Recognition and Machine Learning, Springer, 2006.
2. Yegnanarayana, B., Artificial Neural Networks PHI Learning Pvt. Ltd, 2009.

2080546: MOBILE COMPUTING (Professional Elective-IV)

B.Tech. IV Year - I Sem	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Prerequisites:

- A course on "Computer networks".
- A course on "Data Structures".
- A course on "Operating Systems".

Course Objectives:

- To understand the basic concepts of mobile computing.
- To learn the basics of mobile telecommunication system.
- To be familiar with the network layer protocols and Ad-Hoc networks.
- To know the basis of transport and application layer protocols.
- To gain knowledge about different mobile platforms and application development.

Course Outcomes: The students will be able to:

- Learn basics of mobile telecommunication systems.
- Understand functionality of MAC, network layer and identify a routing protocol for a givenAd hoc network.
- Learn the functionality of Transport and Application layers.
- Develop a mobile application using android/blackberry/ios/Windows SDK

UNIT-I
INTRODUCTIO
N

Introduction to Mobile Computing – Applications of Mobile Computing- Generations of Mobile Communication Technologies- Multiplexing – Spread spectrum -MAC Protocols – SDMA- TDMA- FDMA- CDMA.

UNIT-II
MOBILE TELECOMMUNICATION SYSTEM

Introduction to Cellular Systems – GSM – Services - Architecture - Protocols – Security – Satellite Systems – History – Applications – GEO – LEO - MEO – GPRS- Services – Architecture
- UMTS – Network Architecture.

UNIT–III
MOBILE NETWORK LAYER

MANET, Mobile IP, Classification of Multicast Routing Protocols, Multicast Routing Protocols: DSDV, DSR, AODV ,ZRP, DHCP, Security issues in MANETs, Introduction to Vehicular AdHoc networks (VANET) – MANET Vs VANET.

UNIT–IV
MOBILE TRANSPORT AND APPLICATION LAYER

Classical TCP Improvements – Inderect TCP - Mobile TCP – Transaction Oriented TCP – Wireless Application Protocols – Architecture – WDP – WTLS – WTP –WSP – WAE – WML –
WML Script.

UNIT-V

MOBILE PLATFORMS AND APPLICATIONS

Operating Systems for Mobile Computing – Special Constraints & Requirements – Commercial Mobile Operating Systems – Windows Mobile, iOS, Android, BlackBerry – Mobile Commerce – Applications – Structure.

TEXT BOOKS:

1. Jochen Schiller, ―Mobile Communications, PHI, Second Edition, 2003.
2. Prasant Kumar Pattnaik, Rajib Mall ―Fundamentals of Mobile Computing, PHI Learning Pvt.Ltd, New Delhi – 2012 .

REFERENCES:

1. Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobile systems", Thomson Asia Pvt Ltd, 2005.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, ―Principles ofMobile Computing, Springer, 2003.
3. William.C.Y.Lee,―Mobile Cellular Telecommunications-Analog and Digital Systems‖,Second Edition, Tata McGraw Hill Edition ,2006.
4. C.K. Toh, ―Ad Hoc Mobile Wireless Networks‖, First Edition, Pearson Education, 2002.