MOTHER TERESA INSTITUTE OF SCIENCE AND TECHNOLOGY
AUTONOMOUS
B.Tech. in COMPUTER SCIENCE AND ENGINEERING (AI&ML)
COURSE STRUCTURE & SYLLABUS
(M24 Regulation)

I YEAR I SEMESTER

S. No.	Course Code	Course	L	T	P	Credits
1.	M241ACSM101	Matrices and Calculus	3	1	0	4
2.	M241ACSM102	Applied Physics	3	1	0	4
3.	M241ACSM103	Programming for Problem Solving	3	0	0	3
4.	M241ACSM104	Engineering Workshop	0	1	3	2.5
5.	M241ACSM105	English for Skill Enhancement	2	0	0	2
6.	M241ACSM106	Elements of Computer Science & Engineering	0	0	2	1
7.	M241ACSM107	Applied Physics Laboratory	0	0	3	1.5
8.	M241ACSM108	Programming for Problem Solving Laboratory	0	0	2	1
9.	M241ACSM109	English Language and Communication Skills Laboratory	0	0	2	1
10.	*M241ACSM110	Environmental Science	3	0	0	0
		Induction Program				
		Total	14	3	12	20

I YEAR II SEMESTER

S. No.	Course Code	Course	L	T	P	Credits
1.	M241ACSM201	Ordinary Differential Equations and Vector Calculus	3	1	0	4
2.	M241ACSM202	Engineering Chemistry	3	1	0	4
3.	M241ACSM203	Computer Aided Engineering Graphics	1	0	4	3
4.	M241ACSM204	Basic Electrical Engineering	2	0	0	2
5.	M241ACSM205	Electronic Devices and Circuits	2	0	0	2
6.	M241ACSM206	Python Programming Laboratory	0	1	2	2
7.	M241ACSM207	Engineering Chemistry Laboratory	0	0	2	1
8.	M241ACSM208	Basic Electrical Engineering Laboratory	0	0	2	1
9.	M241ACSM209	IT Workshop	0	0	2	1
		Total	11	3	12	20

II YEAR I SEMESTER

S. No.	Course Code	Course	L	T	P	Credits
1	M241ACSM301	Mathematical and Statistical Foundations	3	1	0	4
2	M241ACSM302	Data Structures	3	0	0	3
3	M241ACSM303	Computer Organization and Architecture	3	0	0	3
4	M241ACSM304	Software Engineering	3	0	0	3
5	M241ACSM305	Operating Systems	3	0	0	3
6	M241ACSM306	Introduction to Data Structures Lab	0	0	2	1
7	M241ACSM307	Operating Systems Lab	0	0	2	1
8	M241ACSM308	Software Engineering Lab	0	0	2	1
9	M241ACSM309	Node JS/ React JS/ Django	0	0	2	1
	*M241ACSM310	Constitution of India	3	0	0	0
		Total	18	0	10	20

BOARD OF STUDIES MEMBERS

S.NO	Name of the Member	Signature	S.No	Name of the Member	Signature
1	Dr.J. UJWALA REKHA		5	Mr.P.MARESWARA RAO	
2	Dr.KONERU SUWARNA VANI		6	Mrs.M. REVATHI	
3	Dr.A.VISHNUVARDHAN REDDY		7	Mr.CH RAJA JACOB	
4	Mr.SURENDRA VARMA		8	Mrs. K.NIRUSHA	

II YEAR II SEMESTER

S. No.	Course Code	Course	L	T	P	Credits
1	M241ACSM401	Discrete Structures & Graph Theory	3	0	0	3
2	M241ACSM402	Automata Theory and Compiler Design	3	0	0	3
3	M241ACSM403	Database Management Systems	3	0	0	3
4	M241ACSM404	Introduction to Artificial Intelligence	3	0	0	3
5	M241ACSM405	Object Oriented Programming through Java	3	0	0	3
6	M241ACSM406	Database Management Systems Lab	0	0	2	1
7	M241ACSM407	Java Programming Lab	0	0	2	1
8	M241ACSM408	Real-time Research Project/Field-Based Research Project	0	0	4	2
9	M241ACSM409	Prolog/ Lisp/ Pyswip	0	0	2	1
10	*M241AMC410	Gender Sensitization Lab	0	0	2	0
		Total	15	0	12	20

III YEAR I SEMESTER
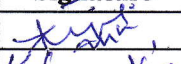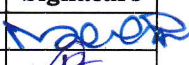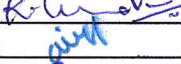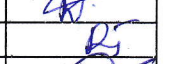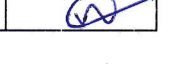
S. No.	Course Code	Course	L	T	P	Credits
1	M241ACSM501	Design and Analysis of Algorithms	3	1	0	4
2	M241ACSM502	Machine Learning	3	0	0	3
3	M241ACSM503	Computer Networks	3	0	0	3
4	M241ACSM504	Business Economics & Financial Analysis	3	0	0	3
5		Professional Elective-I	3	0	0	3
6	M241ACSM505	Machine Learning Lab	0	0	2	1
7	M241ACSM506	Computer Networks Lab	0	0	2	1
8	M241ACSM508	Advanced English Communication Skills Lab	0	0	2	1
9	M241ACSM507	UI design- Flutter	0	0	2	1
10	* M241ACSM510	Intellectual Property Rights	3	0	0	0
		Total	18	01	08	20

III YEAR II SEMESTER

S. No.	Course Code	Course	L	T	P	Credits
1	M241ACSM601	Knowledge Representation and Reasoning	3	0	0	3
2	M241ACSM602	Data Analytics	3	0	0	3
3	M241ACSM603	Natural Language Processing	3	0	0	3
4		Professional Elective - II	3	0	0	3
5		Open Elective-I	3	0	0	3
6	M241ACSM604	Natural Language Processing Lab	0	0	3	1.5
7	M241ACSM605	Data Analytics Lab	0	0	3	1.5
8	M241ACSM606	Industrial Oriented Mini Project/ Internship/Skill Development Course (DevOps)	0	0	4	2
9	* M241ACSM609	Environmental Science	3	0	0	0
		Total	18	0	10	20

Environmental Science in III Yr II Sem Should be Registered by Lateral Entry Students Only.

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IV YEAR I SEMESTER

S. No.	Course Code	Course	L	T	P	Credits
1	M241ACSM701	Deep Learning	3	0	0	3
2	M241ACSM702	Nature Inspired Computing	2	0	0	2
3		Professional Elective -III	3	0	0	3
4		Professional Elective -IV	3	0	0	3
5		Open Elective - II	3	0	0	3
6	M241ACSM703	Professional Practice, Law & Ethics	2	0	0	2
7		Professional Elective - III Lab	0	0	2	1
8		Project Stage - I	0	0	6	3
		Total Credits	16	0	8	20

IV YEAR II SEMESTER

S. No.	Course Code	Course	L	T	P	Credits
1		Professional Elective - V	3	0	0	3
2		Professional Elective - VI	3	0	0	3
3		Open Elective - III	3	0	0	3
4	M241ACSM801	Project Stage - II including Seminar	0	0	22	11
		Total Credits	9	0	22	20

*MC – Satisfactory/Unsatisfactory

Professional Elective-I

M241AAM511PE	Graph Theory
M241AAM512PE	Introduction to Data Science
M241AAM513PE	Web Programming
M241AAM514PE	Image Processing
M241AAM515PE	Computer Graphics

Professional Elective - II
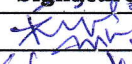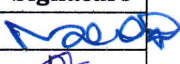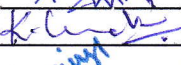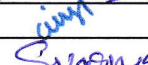
M241AAM621PE	Software Testing Methodologies
M241AAM622PE	Information Retrieval Systems
M241AAM623PE	Pattern Recognition
M241AAM624PE	Computer Vision and Robotics
M241AAM625PE	Data Warehousing and Business Intelligence

Professional Elective - III

M241AAM731PE	Internet of Things
M241AAM732PE	Data Mining
M241AAM733PE	Scripting Languages
M241AAM734PE	Mobile Application Development
M241AAM735PE	Cloud Computing

Courses in PE - III and PE - III Lab must be in 1-1 correspondence.

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Professional Elective -IV

M241AAM741PE	Quantum Computing
M241AAM742PE	Expert Systems
M241AAM743PE	Semantic Web
M241AAM744PE	Game Theory
M241AAM745PE	Mobile Computing

Professional Elective - V

M241AAM851PE	Social Network Analysis
M241AAM852PE	Federated Machine Learning
M241AAM853PE	Augmented Reality & Virtual Reality
M241AAM854PE	Web Security
M241AAM855PE	Ad-hoc & Sensor Networks

Professional Elective – VI

M241AAM861PE	Speech and Video Processing
M241AAM862PE	Robotic Process Automation
M241AAM863PE	Randomized Algorithms
M241AAM864PE	Cognitive Computing
M241AAM865PE	Conversational AI

Open Elective I:
1. M241AAM611OE: Introduction to Data Science
2. M241AAM612OE: Data Structures
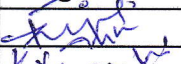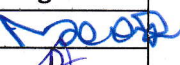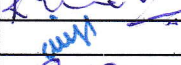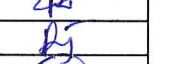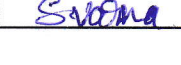
Open Elective II:
1. M241AAM721OE: Introduction to Natural Language Processing
2. M241AAM722OE: Artificial Intelligence

Open Elective III:
1. M241AAM831OE: Chatbots
2. M241AAM832OE: Machine Learning

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MOTHER TERESA INSTITUTE OF SCIENCE AND TECHNOLOGY
AUTONOMOUS

B.Tech. in COMPUTER SCIENCE AND ENGINEERING (AI & ML) COURSE STRUCTURE & SYLLABUS
(M24 Regulations)
Applicable from AY 2024-25 Batch

I YEAR I SEMESTER

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5.	M241ACSM105	English for Skill Enhancement	2	0	0	2
6.	M241ACSM106	Elements of Computer Science & Engineering	0	0	2	1
7.	M241ACSM107	Applied Physics Laboratory	0	0	3	1.5
8.	M241ACSM108	Programming for Problem Solving Laboratory	0	0	2	1
9.	M241ACSM109	English Language and Communication Skills Laboratory	0	0	2	1
10.	*M241ACSM110	Environmental Science	3	0	0	0
		Induction Program				
		Total	**14**	**3**	**12**	**20**

I YEAR II SEMESTER

S. No.	Course Code	Course	L	T	P	Credits
1.	M241ACSM201	Ordinary Differential Equations and Vector Calculus	3	1	0	4
2.	M241ACSM202	Engineering Chemistry	3	1	0	4
3.	M241ACSM203	Computer Aided Engineering Graphics	1	0	4	3
4.	M241ACSM204	Basic Electrical Engineering	2	0	0	2
5.	M241ACSM205	Electronic Devices and Circuits	2	0	0	2
6.	M241ACSM206	Python Programming Laboratory	0	1	2	2
7.	M241ACSM207	Engineering Chemistry Laboratory	0	0	2	1
8.	M241ACSM208	Basic Electrical Engineering Laboratory	0	0	2	1
9.	M241ACSM209	IT Workshop	0	0	2	1
		Total	**11**	**3**	**12**	**20**

M241ACSM101: MATRICES AND CALCULUS

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

Pre-requisites: Mathematical Knowledge at pre-university level

Course Objectives: To learn
- 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 eigenvalues and eigenvectors and to reduce the quadratic form to canonical form
- Geometrical approach to the mean value theorems and their application to the mathematical problems
- Evaluation of surface areas and volumes of revolutions of curves.
- Evaluation of improper integrals using Beta and Gamma functions.
- Partial differentiation, concept of total derivative
- Finding maxima and minima of function of two and three variables.
- Evaluation of multiple integrals and their applications

Course outcomes: After learning the contents of this paper the student must be able to
- Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
- Find the Eigenvalues and Eigen vectors
- Reduce the quadratic form to canonical form using orthogonal transformations.
- Solve the applications on the mean value theorems.
- Evaluate the improper integrals using Beta and Gamma functions
- Find the extreme values of functions of two variables with/ without constraints.
- Evaluate the multiple integrals and apply the concept to find areas, volumes

UNIT - I: Matrices   **10 L**
Rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method, System of linear equations: Solving system of Homogeneous and Non-Homogeneous equations by Gauss elimination method, Gauss Seidel Iteration Method.

UNIT - II: Eigen values and Eigen vectors   **10 L**
Linear Transformation and Orthogonal Transformation: Eigenvalues, Eigenvectors 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 and Nature of the Quadratic Forms, Reduction of Quadratic form to canonical forms by Orthogonal Transformation.

UNIT - III: Calculus   **10 L**
Mean value theorems: Rolle's theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem, Taylor's Series.
Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves (Only in Cartesian coordinates), Definition of Improper Integral: Beta and Gamma functions and their applications.

UNIT - IV: Multivariable Calculus (Partial Differentiation and applications)   **10 L**
Definitions of Limit and continuity.
Partial Differentiation: Euler's Theorem, Total derivative, Jacobian, Functional dependence & independence. Applications: Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

UNIT-V: Multivariable Calculus (Integration)   **8 L**

Evaluation of Double Integrals (Cartesian and polar coordinates), change of order of integration (only 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: Areas (by double integrals) and volumes (by double integrals and triple integrals).

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Editon, 2016.

REFERENCE BOOKS:

1. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9thEdition,Pearson, Reprint, 2002.
3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
4. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.

M241ACSM102: APPLIED PHYSICS

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

Pre-requisites: 10 + 2 Physics
Course Objectives: The objectives of this course for the student are to:
1. Understand the basic principles of quantum physics and band theory of solids.
2. Understand the underlying mechanism involved in construction and working principles of various semiconductor devices.
3. Study the fundamental concepts related to the dielectric, magnetic and energy materials.
4. Identify the importance of nanoscale, quantum confinement and various fabrications techniques.
5. Study the characteristics of lasers and optical fibres.

Course Outcomes: At the end of the course the student will be able to:
1. Understand physical world from fundamental point of view by the concepts of Quantum mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.
2. Identify the role of semiconductor devices in science and engineering Applications.
3. Explore the fundamental properties of dielectric, magnetic materials and energy for their applications.
4. Appreciate the features and applications of Nanomaterials.
5. Understand various aspects of Lasers and Optical fiber and their applications in diverse fields.

UNIT - I: QUANTUM PHYSICS AND SOLIDS

Quantum Mechanics: Introduction to quantum physics, blackbody radiation – Stefan-Boltzmann's law, Wein's and Rayleigh-Jean's law, Planck's radiation law - photoelectric effect - Davisson and Germer experiment –Heisenberg uncertainty principle - Born interpretation of the wave function — time independent Schrodinger wave equation - particle in one dimensional potential box.

Solids: Symmetry in solids, free electron theory (Drude & Lorentz, Sommerfeld) - Fermi-Dirac distribution - Bloch's theorem -Kronig-Penney model — E-K diagram- effective mass of electron- origin of energy bands- classification of solids.

UNIT - II: SEMICONDUCTORS AND DEVICES

Intrinsic and extrinsic semiconductors — Hall effect - direct and indirect band gap semiconductors - construction, principle of operation and characteristics of P-N Junction diode, Zener diode and bipolar junction transistor (BJT)–LED, PIN diode, avalanche photo diode (APD) and solar cells, their structure, materials, working principle and characteristics.

UNIT - III: DIELECTRIC, MAGNETIC AND ENERGY MATERIALS

Dielectric Materials: Basic definitions- types of polarizations (qualitative) - ferroelectric, piezoelectric, and pyroelectric materials – applications – liquid crystal displays (LCD) and crystal oscillators.

Magnetic Materials: Hysteresis - soft and hard magnetic materials - magnetostriction, magnetoresistance - applications - bubble memory devices, magnetic field sensors and multiferroics. Energy Materials: Conductivity of liquid and solid electrolytes- superionic conductors - materials and electrolytes for super capacitors - rechargeable ion batteries, solid fuel cells.

UNIT - IV: NANOTECHNOLOGY

Nanoscale, quantum confinement, surface to volume ratio, bottom-up fabrication: sol-gel, precipitation, combustion methods — top-down fabrication: ball milling - physical vapor deposition (PVD) - chemical vapor deposition (CVD) - characterization techniques - XRD, SEM &TEM - applications of nanomaterials.

UNIT - V: LASER AND FIBER OPTICS

Lasers: Laser beam characteristics-three quantum processes-Einstein coefficients and their relations-lasing action - pumping methods- ruby laser, He-Ne laser , CO2 laser, Argon ion Laser, Nd:YAG laser- semiconductor laser-applications of laser.

Fiber Optics: Introduction to optical fiber- advantages of optical Fibers - total internal reflection-construction of optical fiber - acceptance angle - numerical aperture- classification of optical fibers-losses in optical fiber - optical fiber for communication system - applications.

TEXT BOOKS:

1. M. N. Avadhanulu, P.G. Kshirsagar & TVS Arun Murthy" A Text book of Engineering Physics"- S. Chand Publications, 11th Edition 2019.
2. Engineering Physics by Shatendra Sharma and Jyotsna Sharma, Pearson Publication,2019
3. Semiconductor Physics and Devices- Basic Principle — Donald A, Neamen, Mc Graw Hill, 4thEdition,2021.
4. B.K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning, 2ndEdition,2022.
5. Essentials of Nanoscience & Nanotechnology by Narasimha Reddy Katta, Typical Creatives NANO DIGEST, 1st Edition, 2021.

REFERENCE BOOKS:

1. Quantum Physics, H.C. Verma, TBS Publication, 2nd Edition 2012.
2. Fundamentals of Physics – Halliday, Resnick and Walker, John Wiley & Sons, 11th Edition, 2018.
3. Introduction to Solid State Physics, Charles Kittel, Wiley Eastern, 2019.
4. Elementary Solid State Physics, S.L. Gupta and V. Kumar, Pragathi Prakashan, 2019.
5. A.K. Bhandhopadhya - Nano Materials, New Age International, 1stEdition, 2007.
6. Energy Materials a Short Introduction to Functional Materials for Energy Conversion and Storage Aliaksandr S. Bandarenka, CRC Press Taylor & Francis Group
7. Energy Materials, Taylor & Francis Group, 1st Edition, 2022.

M241ACSM103: PROGRAMMING FOR PROBLEM SOLVING

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

Course Objectives:

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

Course Outcomes: The student will learn

- 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 the C programming language.
- To decompose a problem into functions and to develop modular reusable code.
- To use arrays, pointers, strings and structures to write C programs.
- Searching and sorting problems.

UNIT - I: Introduction to Programming

Compilers, compiling and executing a program.

Representation of Algorithm - Algorithms for finding roots of a quadratic equations, finding minimum and maximum numbers of a given set, finding if a number is prime number Flowchart/Pseudocode with examples, Program design and structured programming

Introduction to C Programming Language: variables (with data types and space requirements), Syntax and Logical Errors in compilation, object and executable code, Operators, expressions and precedence, Expression evaluation, Storage classes (auto, extern, static and register), type conversion, The main method and command line arguments Bitwise operations: Bitwise AND, OR, XOR and NOT operators

Conditional Branching and Loops: Writing and evaluation of conditionals and consequent branching with if, if-else, switch-case, ternary operator, goto, Iteration with for, while, do- while loops

I/O: Simple input and output with scanf and printf, formatted I/O, Introduction to stdin, stdout and stderr. Command line arguments

UNIT - II: Arrays, Strings, Structures and Pointers:

Arrays: one and two dimensional arrays, creating, accessing and manipulating elements of arrays Strings: Introduction to strings, handling strings as array of characters, basic string functions available in C (strlen, strcat, strcpy, strstr etc.), arrays of strings

Structures: Defining structures, initializing structures, unions, Array of structures

Pointers: Idea of pointers, Defining pointers, Pointers to Arrays and Structures, Use of Pointers in self- referential structures, usage of self referential structures in linked list (no implementation) Enumeration data type

UNIT - III: Preprocessor and File handling in C:

Preprocessor: Commonly used Preprocessor commands like include, define, undef, if, ifdef, ifndef Files: Text and Binary files, Creating and Reading and writing text and binary files, Appending data to existing files, Writing and reading structures using binary files, Random access using fseek, ftell and rewind functions.

UNIT - IV: Function 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, passing pointers to functions, idea of call by reference, Some C standard functions and libraries

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: Searching and Sorting:
Basic searching in an array of elements (linear and binary search techniques), Basic algorithms to sort array of elements (Bubble, Insertion and Selection sort algorithms), Basic concept of order of complexity through the example programs

TEXT BOOKS:
1. Jeri R. Hanly and Elliot B.Koffman, Problem solving and Program Design in C 7th Edition, Pearson
2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)

REFERENCE BOOKS:
1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
2. E. Balagurusamy, Computer fundamentals and C, 2nd Edition, McGraw-Hill
3. Yashavant Kanetkar, Let Us C, 18th Edition, BPB
4. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression)
5. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
6. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition
7. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill

M241ACSM104: ENGINEERING WORKSHOP

B.Tech. I Year I Sem.   **L T P C**
                                                                                          0 1 3 2.5

Pre-requisites: Practical skill

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, equipments 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.
- To study commonly used carpentry joints.
- To have practical exposure to various welding and joining processes.
- Identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances.

Course Outcomes: At the end of the course, the student will be able to:
- Study and practice on machine tools and their operations
- Practice on manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.
- Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
- Apply basic electrical engineering knowledge for house wiring practice.

1. TRADES FOR EXERCISES:
At least two exercises from each trade:
  I.   Carpentry – (T-Lap Joint, Dovetail Joint, Mortise & Tenon Joint)
  II.   Fitting – (V-Fit, Dovetail Fit & Semi-circular fit)
  III. Tin-Smithy – (Square Tin, Rectangular Tray & Conical Funnel)
  IV.   Foundry – (Preparation of Green Sand Mould using Single Piece and Split Pattern)
  V.   Welding Practice – (Arc Welding & Gas Welding)
  VI.   House-wiring – (Parallel & Series, Two-way Switch and Tube Light)
  VII. Black Smithy – (Round to Square, Fan Hook and S-Hook)

2. TRADES FOR DEMONSTRATION & EXPOSURE:
Plumbing, Machine Shop, Metal Cutting (Water Plasma), Power tools in construction and Wood Working

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

REFERENCE BOOKS:
  1. Work shop Manual - P. Kannaiah/ K.L. Narayana/ Scitech
  2. Workshop Manual / Venkat Reddy/ BSP

M241ACSM105: ENGLISH FOR SKILL ENHANCEMENT

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

                                                                                     2 0 0 2

Course Objectives: This course will enable the students to:
1. Improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.
2. Develop study skills and communication skills in various professional situations.
3. Equip students to study engineering subjects more effectively and critically using the theoretical and practical components of the syllabus.

Course Outcomes: Students will be able to:
1. Understand the importance of vocabulary and sentence structures.
2. Choose appropriate vocabulary and sentence structures for their oral and written communication.
3. Demonstrate their understanding of the rules of functional grammar.
4. Develop comprehension skills from the known and unknown passages.
5. Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.
6. Acquire basic proficiency in reading and writing modules of English.

UNIT - I

Chapter entitled '***Toasted English***' **by R.K.Narayan** from ***"English: Language, Context and Culture"*** published by Orient BlackSwan, Hyderabad.

Vocabulary: The Concept of Word Formation -The Use of Prefixes and Suffixes - Acquaintance with Prefixes and Suffixes from Foreign Languages to form Derivatives - Synonyms and Antonyms

Grammar: Identifying Common Errors in Writing with Reference to Articles and Prepositions.

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

Writing: 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.

UNIT - II

Chapter entitled **'Appro JRD' by Sudha Murthy** from ***"English: Language, Context and Culture"*** **published** by Orient BlackSwan, Hyderabad.

Vocabulary: Words Often Misspelt - Homophones, Homonyms and Homographs

Grammar: Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject-verb Agreement.

Reading: Sub-Skills of Reading – Skimming and Scanning – Exercises for Practice

Writing: Nature and Style of Writing- Defining /Describing People, Objects, Places and Events — Classifying- Providing Examples or Evidence.

UNIT - III

Chapter entitled **'Lessons from Online Learning' by F.Haider Alvi, Deborah Hurst et al** from ***"English: Language, Context and Culture"*** published by Orient BlackSwan, Hyderabad.

Vocabulary: Words Often Confused - 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 – Intensive Reading and Extensive Reading – Exercises for Practice.

Writing: Format of a Formal Letter-Writing Formal Letters E.g.., Letter of Complaint,
                     Letter of Requisition, Email Etiquette, Job Application with CV/Resume.

UNIT - IV
Chapter entitled **'Art and Literature' by Abdul Kalam** from *"English: Language, Context and Culture"* published by Orient BlackSwan, Hyderabad.
Vocabulary: Standard Abbreviations in English
Grammar: Redundancies and Clichés in Oral and Written Communication.
Reading: Survey, Question, Read, Recite and Review (SQ3R Method) - Exercises for Practice
Writing: Writing Practices- Essay Writing-Writing Introduction and Conclusion -Précis Writing.

UNIT - V
Chapter entitled **'Go, Kiss the World' by Subroto Bagchi** from *"English: Language, Context and Culture"* published by Orient BlackSwan, Hyderabad.
Vocabulary: Technical Vocabulary and their Usage
Grammar: Common Errors in English (*Covering all the other aspects of grammar which were not covered in the previous units*)
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.

Note: *Listening and Speaking Skills which are given under Unit-6 in AICTE Model Curriculum are covered in the syllabus of ELCS Lab Course.*

> **Note: 1**. As the syllabus of English given in AICTE *Model Curriculum-2018 for B.Tech First Year is Open-ended,* besides following the prescribed textbook, it is required to prepare teaching/learning materials **by the teachers collectively** in the form of handouts based on the needs of the students in their respective colleges for effective teaching/learning in the class.

> **Note**: **2**.Based on the recommendations of NEP2020, teachers are requested to be flexible to adopt Blended Learning in dealing with the course contents .They are advised to teach 40 percent of each topic from the syllabus in blended mode.

TEXT BOOK:
1. "English: Language, Context and Culture" by Orient BlackSwan Pvt. Ltd, Hyderabad. 2022. Print.

REFERENCE BOOKS:
1. Effective Academic Writing by Liss and Davis (OUP)
2. Richards, Jack C. (2022) Interchange Series. Introduction, 1,2,3. Cambridge University Press
3. Wood, F.T. (2007). Remedial English Grammar. Macmillan.
4. Chaudhuri, Santanu Sinha. (2018). Learn English: A Fun Book of Functional Language, Grammar and Vocabulary. (2nd ed.,). Sage Publications India Pvt. Ltd.
5. (2019). Technical Communication. Wiley India Pvt. Ltd.
6. Vishwamohan, Aysha. (2013). English for Technical Communication for Engineering Students. Mc Graw-Hill Education India Pvt. Ltd.
7. Swan, Michael. (2016). Practical English Usage. Oxford University Press. Fourth Edition.

M241ACSM106: ELEMENTS OF COMPUTER SCIENCE AND ENGINEERING

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

                                                                                   0   0   2   1

Course Objective: To provide an overview of the subjects of computer science and engineering.

Course Outcomes:

1. Know the working principles of functional units of a basic Computer
2. Understand program development, the use of data structures and algorithms in problem solving.
3. Know the need and types of operating system, database systems.
4. Understand the significance of networks, internet, WWW and cyber security.
5. Understand Autonomous systems, the application of artificial intelligence.

UNIT – I

Basics of a Computer – Hardware, Software, Generations of computers. Hardware - functional units, Components of CPU, Memory — hierarchy, types of memory, Input and output devices. Software — systems software, application software, packages, frameworks, IDEs.

UNIT – II

Software development – waterfall model, Agile, Types of computer languages – Programming, markup, scripting Program Development – steps in program development, flowcharts, algorithms, data structures – definition, types of data structures

UNIT – III

Operating systems: Functions of operating systems, types of operating systems, Device & Resource management

Database Management Systems: Data models, RDBMS, SQL, Database Transactions, data centers, cloud services

UNIT – IV

Computer Networks: Advantages of computer networks, LAN, WAN, MAN, internet, WiFi, sensor networks, vehicular networks, 5G communication.

World Wide Web – Basics, role of HTML, CSS, XML, Tools for web designing, Social media, Online social networks.

Security – information security, cyber security, cyber laws

UNIT – V

Autonomous Systems: IoT, Robotics, Drones, Artificial Intelligence – Learning, Game Development, natural language processing, image and video processing.

Cloud Basics

TEXT BOOK:

1. Invitation to Computer Science, G. Michael Schneider, Macalester College, Judith L. Gersting University of Hawaii, Hilo, Contributing author: Keith Miller University of Illinois, Springfield.

REFERENCE BOOKS:

1. Fundamentals of Computers, Reema Thareja, Oxford Higher Education, Oxford University Press.
2. Introduction to computers, Peter Norton, 8th Edition, Tata McGraw Hill.
3. Computer Fundamentals, Anita Goel, Pearson Education India, 2010.
4. Elements of computer science, Cengage.

M241ACSM107: APPLIED PHYSICS LABORATORY

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

Course Objectives: The objectives of this course for the student to
1. Capable of handling instruments related to the Hall effect and photoelectric effect experiments and their measurements.
2. Understand the characteristics of various devices such as PN junction diode, Zener diode, BJT, LED, solar cell, lasers and optical fiber and measurement of energy gap and resistivity of semiconductor materials.
3. Able to measure the characteristics of dielectric constant of a given material.
4. Study the behavior of B-H curve of ferromagnetic materials.
5. Understanding the method of least squares fitting.

Course Outcomes: The students will be able to:
1. Know the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment.
2. Appreciate quantum physics in semiconductor devices and optoelectronics.
3. Gain the knowledge of applications of dielectric constant.
4. Understand the variation of magnetic field and behavior of hysteresis curve.
5. Carried out data analysis.

LIST OF EXPERIMENTS:
1. Determination of work function and Planck's constant using photoelectric effect.
2. Determination of Hall co-efficient and carrier concentration of a given semiconductor.
3. Characteristics of series and parallel LCR circuits.
4. V-I characteristics of a p-n junction diode and Zener diode
5. Input and output characteristics of BJT (CE, CB & CC configurations)
6. a) V-I and L-I characteristics of light emitting diode (LED)
   b) V-I Characteristics of solar cell
7. Determination of Energy gap of a semiconductor.
8. Determination of the resistivity of semiconductor by two probe method.
9. Study B-H curve of a magnetic material.
10. Determination of dielectric constant of a given material
11. a) Determination of the beam divergence of the given LASER beam
    b) Determination of Acceptance Angle and Numerical Apertureof an optical fiber.
12. Understanding the method of least squares – torsional pendulum as an example.

Note: Any 8 experiments are to be performed.

REFERENCE BOOK:
1. S. Balasubramanian, M.N. Srinivasan "A Text book of Practical Physics"- S Chand Publishers, 2017.

M241ACSM108: PROGRAMMING FOR PROBLEM SOLVING LABORATORY

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

                                        0 0 2 1

[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.html
Eclipse: http://www.eclipse.org
This list is not exhaustive and is NOT in any order of preference]

Course Objectives: The students will learn the following:
- 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 Write programs using the Dynamic Memory Allocation concept.
- To create, read from and write to text and binary files

Course Outcomes: The candidate is expected to be able to:
- formulate the algorithms for simple problems
- translate given algorithms to a working and correct program
- correct syntax errors as reported by the compilers
- identify and correct logical errors encountered during execution
- represent and manipulate data with arrays, strings and structures
- use pointers of different types
- create, read and write to and from simple text and binary files
- modularize the code with functions so that they can be reused

Practice sessions:
    a. Write a simple program that prints the results of all the operators available in C (including pre/ post increment , bitwise and/or/not , etc.). Read required operand values from standard input.
    b. Write a simple program that converts one given data type to another using auto conversion and casting. Take the values from standard input.

Simple numeric problems:
    a. Write a program for finding the max and min from the three numbers.
    b. Write the program for the simple, compound interest.
    c. Write a program that declares Class awarded for a given percentage of marks, where mark <40%= Failed, 40% to <60% = Second class, 60% to <70%=First class, >= 70% = Distinction. Read percentage from standard input.
    d. Write a program that prints a multiplication table for a given number and the number of rows in the table. For example, for a number 5 and rows = 3, the output should be:
    e. 5 x 1 = 5
    f.   5 x 2 = 10
    g. 5 x 3 = 15
    h. Write a program that shows the binary equivalent of a given positive number between 0 to 255.

Expression Evaluation:

a. A building has 10 floors with a floor height of 3 meters each. A ball is dropped from the top of the building. Find the time taken by the ball to reach each floor. (Use the formula $s = ut+(1/2)at^2$ where u and a are the initial velocity in m/sec (= 0) and acceleration in m/sec^2 (= 9.8 m/s^2)).

b. Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

c. Write a program that finds if a given number is a prime number

d. Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome.

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. Write a C program to find the roots of a Quadratic equation.

h. Write a C program to calculate the following, where x is a fractional value.

i. $1-x/2 +x^2/4-x^3/6$

j. Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression: $1+x+x^2+x^3+\ldots\ldots\ldots+x^n$. For example: if n is 3 and x is 5, then the program computes 1+5+25+125.

Arrays, Pointers and Functions:

a. Write a C program to find the minimum, maximum and average in an array of integers.

b. Write a function to compute mean, variance, Standard Deviation, sorting of n elements in a single dimension array.

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

d. Addition of Two Matrices

e. Multiplication of Two Matrices

f. Transpose of a matrix with memory dynamically allocated for the new matrix as row and column counts may not be the same.

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

h. To find the factorial of a given integer.

i. To find the GCD (greatest common divisor) of two given integers.

j. To find x^n

k. Write a program for reading elements using a pointer into an array and display the values using the array.

l. Write a program for display values reverse order from an array using a pointer.

m. Write a program through a pointer variable to sum of n elements from an array.

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 lowercase characters with their uppercase equivalents.

c. Write a C program to count the number of times a character occurs in a text file. The file name and the character are supplied as command line arguments.

d. Write a C program that does the following:
    It should first create a binary file and store 10 integers, where the file name and 10 values are given in the command line. (hint: convert the strings using atoi function)
    Now the program asks for an index and a value from the user and the value at that index should be changed to the new value in the file. (hint: use fseek function)
    The program should then read all 10 values and print them back.

e. Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file).

Strings:
a. Write a C program to convert a Roman numeral ranging from I to L to its decimal equivalent.
b. Write a C program that converts a number ranging from 1 to 50 to Roman equivalent
c. Write a C program that uses functions to perform the following operations:
d. To insert a sub-string into a given main string from a given position.
e. To delete n Characters from a given position in a given string.
f. Write a C program to determine if the given string is a palindrome or not (Spelled same in both directions with or without a meaning like madam, civic, noon, abcba, etc.)
g. Write a C program that displays the position of a character ch in the string S or – 1 if S doesn't contain ch.
h. Write a C program to count the lines, words and characters in a given text.

Miscellaneous:
a. Write a menu driven C program that allows a user to enter n numbers and then choose between finding the smallest, largest, sum, or average. The menu and all the choices are to be functions. Use a switch statement to determine what action to take. Display an error message if an invalid choice is entered.

b. Write a C program to construct a pyramid of numbers as follows:

```
1           *           1           1           *
1 2         * *         2 3         2 2         * *
1 2 3       * * *       4 5 6       3 3 3       * * *
                                    4 4 4 4     * *
                                                *
```

Sorting and Searching:
a. Write a C program that uses non recursive function to search for a Key value in a given
b. list of integers using linear search method.
c. Write a C program that uses non recursive function to search for a Key value in a given
d. sorted list of integers using binary search method.
e. Write a C program that implements the Bubble sort method to sort a given list of
f. integers in ascending order.
g. Write a C program that sorts the given array of integers using selection sort in descending order
h. Write a C program that sorts the given array of integers using insertion sort in ascending order
i. Write a C program that sorts a given array of names

TEXT BOOKS:
1. Jeri R. Hanly and Elliot B.Koffman, Problem solving and Program Design in C 7th Edition, Pearson
2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)

REFERENCE BOOKS:
1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, PHI
2. E. Balagurusamy, Computer fundamentals and C, 2nd Edition, McGraw-Hill
3. Yashavant Kanetkar, Let Us C, 18th Edition, BPB
4. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression)
5. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
6. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition
7. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill

M241ACSM109: ENGLISH LANGUAGE AND COMMUNICATION SKILLS LABORATORY

B.Tech. I Year I Sem.   **L   T   P   C**
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The **English Language and Communication Skills (ELCS) Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations both in formal and informal contexts.

Course Objectives:
- ✓ To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning
- ✓ To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
- ✓ To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking
- ✓ To improve the fluency of students in spoken English and neutralize the impact of dialects.
- ✓ To train students to use language appropriately for public speaking, group discussions and interviews

Course Outcomes: Students will be able to:
- ✓ Understand the nuances of English language through audio- visual experience and group activities
- ✓ Neutralise their accent for intelligibility
- ✓ Speak with clarity and confidence which in turn enhances their employability skills

Syllabus: English Language and Communication Skills Lab (ELCS) shall have two parts:
a.   Computer Assisted Language Learning (CALL) Lab
b.   Interactive Communication Skills (ICS) Lab

Listening Skills:
Objectives
  1. To enable students develop their listening skills so that they may appreciate the role in the LSRW skills approach to language and improve their pronunciation
  2. To equip students with necessary training in listening, so that they can comprehend the speech of people of different backgrounds and regions

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 intonation in sentences.
  • Listening for general content
  • Listening to fill up information
  • Intensive listening
  • Listening for specific information

Speaking Skills:
Objectives
  1. To involve students in speaking activities in various contexts
  2. To enable students express themselves fluently and appropriately in social and professional contexts
  • Oral practice
  • Describing objects/situations/people
  • Role play – Individual/Group activities
  • Just A Minute (JAM) Sessions

The following course content is prescribed for the **English Language and Communication Skills Lab**.

Exercise – I
CALL Lab:
Understand: Listening Skill- Its importance – Purpose- Process- Types- Barriers- Effective Listening. *Practice*: Introduction to Phonetics – Speech Sounds – Vowels and Consonants – Minimal Pairs- Consonant Clusters- Past Tense Marker and Plural Marker- *Testing Exercises*
ICS Lab:
Understand: Spoken vs. Written language- Formal and Informal English.
Practice: Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings – Taking Leave – Introducing Oneself and Others.

Exercise – II
CALL Lab:
Understand: Structure of Syllables – Word Stress– Weak Forms and Strong Forms – Stress pattern in sentences — Intonation.
Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms- Stress pattern in sentences — Intonation - *Testing Exercises*
ICS Lab:
Understand: Features of Good Conversation – Strategies for Effective Communication.
Practice: Situational Dialogues – Role Play- Expressions in Various Situations –Making Requests and Seeking Permissions - Telephone Etiquette.

Exercise - III
CALL Lab:
Understand: Errors in Pronunciation-Neutralising Mother Tongue Interference (MTI).
Practice: Common Indian Variants in Pronunciation – Differences between British and American Pronunciation -*Testing Exercises*
ICS Lab:
Understand: Descriptions- Narrations- Giving Directions and Guidelines – Blog Writing
Practice: Giving Instructions – Seeking Clarifications – Asking for and Giving Directions – Thanking and Responding – Agreeing and Disagreeing – Seeking and Giving Advice – Making Suggestions.

Exercise – IV
CALL Lab:
Understand: Listening for General Details.
Practice: Listening Comprehension Tests - *Testing Exercises*
ICS Lab:
Understand: Public Speaking — Exposure to Structured Talks - Non-verbal Communication- Presentation Skills.
Practice: Making a Short Speech – Extempore- Making a Presentation.

Exercise – V
CALL Lab:
Understand: Listening for Specific Details.
Practice: Listening Comprehension Tests -*Testing Exercises*
ICS Lab:
Understand: Group Discussion
Practice: Group Discussion

Minimum Requirement of infrastructural facilities for ELCS Lab:

1. **Computer Assisted Language Learning (CALL) Lab:**

The Computer Assisted Language Learning Lab has to accommodate 40 students with 40 systems, with one Master Console, LAN facility and English language learning software for self- study by students.

System Requirement (Hardware component):

Computer network with LAN facility (minimum 40 systems with multimedia) with the following specifications:

      i)   Computers with Suitable Configuration

      ii)   High Fidelity Headphones

2. **Interactive Communication Skills (ICS) Lab :**

    The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V. or LCD, a digital stereo –audio & video system and camcorder etc.

 Source of Material (Master Copy):

- *Exercises in Spoken English. Part 1,2,3*. CIEFL and Oxford University Press

Note: Teachers are requested to make use of the master copy and get it tailor-made to suit the contents of the syllabus.

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD.
- Grammar Made Easy by Darling Kindersley.
- Punctuation Made Easy by Darling Kindersley.
- Oxford Advanced Learner's Compass, 10th Edition.
- English in Mind (Series 1-4), Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
- English Pronunciation in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
- English Vocabulary in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS).
- Digital All
- Orell Digital Language Lab (Licensed Version)

REFERENCE BOOKS:

1. (2022). *English Language Communication Skills – Lab Manual cum Workbook.* Cengage Learning India Pvt. Ltd.
2. Shobha, KN & Rayen, J. Lourdes. (2019). *Communicative English – A workbook.* Cambridge University Press
3. Kumar, Sanjay & Lata, Pushp. (2019). *Communication Skills: A Workbook.* Oxford University Press
4. Board of Editors. (2016). *ELCS Lab Manual: A Workbook for CALL and ICS Lab Activities.* Orient Black Swan Pvt. Ltd.
5. Mishra, Veerendra et al. (2020). *English Language Skills: A Practical Approach.* Cambridge University Press.

*M241ACSM110: ENVIRONMENTAL SCIENCE

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

Course Outcomes:
- Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

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, Biomagnification, ecosystem value, services and carrying capacity, Field visits.

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.

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.

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: C**limate 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.

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. Strategies for risk assessment, 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, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.

TEXT BOOKS:
1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies by R. Rajagopalan, Oxford University Press.

REFERENCE BOOKS:
1. Environmental Science: towards a sustainable 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. 2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
6. Introduction to Environmental Science by Y. Anjaneyulu, BS. Publications.

MOTHER TERESA INSTITUTE OF SCIENCE AND TECHNOLOGY
AUTONOMOUS
B.Tech. in COMPUTER SCIENCE AND ENGINEERING (AI&ML)
COURSE STRUCTURE & SYLLABUS
(M24 Regulation)

II YEAR I SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	M241ACSM301	Mathematical and Statistical Foundations	3	1	0	4
2	M241ACSM302	Data Structures	3	0	0	3
3	M241ACSM303	Computer Organization and Architecture	3	0	0	3
4	M241ACSM304	Software Engineering	3	0	0	3
5	M241ACSM305	Operating Systems	3	0	0	3
6	M241ACSM306	Introduction to Data Structures Lab	0	0	2	1
7	M241ACSM307	Operating Systems Lab	0	0	2	1
8	M241ACSM308	Software Engineering Lab	0	0	2	1
9	M241ACSM309	Node JS/ React JS/ DJango	0	0	2	1
10	* M241AMC310	Constitution of India	3	0	0	0
		Total	**18**	**01**	**08**	**20**

II YEAR II SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	M241ACSM401	Discrete Structures & Graph theory	3	0	0	3
2	M241ACSM402	Automata Theory & Compiler Design	3	0	0	3
3	M241ACSM403	Database Management Systems	3	0	0	3
4	M241ACSM404	Introduction to Artificial Intelligence	3	0	0	3
5	M241ACSM405	Object Oriented Programming through Java	3	0	0	3
6	M241ACSM406	Database Management Systems Lab	0	0	2	1
7	M241ACSM407	Java Programming Lab	0	0	2	1
8	M241ACSM408	Real-time Research Project/Field-Based Research Project	0	0	4	2
9	M241ACSM409	Prolog/ Lisp/ Pyswip	0	0	2	1
10	* M241AMC410	Gender Sensitization Lab	0	0	2	0
		Total	**15**	**0**	**12**	**20**

L – Lecture   T – Tutorial   P – Practical   D – Drawing   CH – Contact Hours/Week   C – Credits
SE – Sessional Examination   CA – Class Assessment   ELA – Experiential Learning Assessment
SEE – Semester End Examination   D-D – Day to Day Evaluation   LR – Lab Record   CP – Course Project
PE – Practical Examination

BOARD OF STUDIES MEMBERS

S.NO	Name of the Member	Signature	S.No	Name of the Member	Signature
1	Dr.J. UJWALA REKHA		5	Mr.P.MARESWARA RAO	
2	Dr.KONERU SUWARNA VANI		6	Mrs.M. REVATHI	
3	Dr.A.VISHNUVARDHAN REDDY		7	Mr.CH RAJA JACOB	
4	Mr.SURENDRA VARMA		8	Mrs. K.NIRUSHA	

M241ACSM301: MATHEMATICAL AND STATISTICAL FOUNDATIONS

TEACHING SCHEME		
L	T/P	C
3	1/0	4

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

L	T	P	C
3	**1**	**0**	**4**

Prerequisites: Mathematics courses of first year of study.

Course Objectives:
- The Number Theory basic concepts useful for cryptography etc
- The theory of Probability, and probability distributions of single and multiple random variables
- The sampling theory and testing of hypothesis and making inferences
- Stochastic process and Markov chains.

Course Outcomes: After learning the contents of this course, the student must be able to
   CO-1 :Apply the number theory concepts to cryptography domain
   CO-2:Apply the concepts of probability and distributions to some case studies
   CO-3:Correlate the material of one unit to the material in other units
   CO-4:Resolve the potential misconceptions and hazards in each topic of study.
    CO-5:   Apply Stochastic Process And Markov Process To Solve Various Problems

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	1	1	1							1	1	1
CO2	3	3	2	2	2							1	1	1
CO3	3	2	1	1								2	1	1
CO4	3	3	2	2	2							2	1	1
CO5	3	2										1	1	1

UNIT - 1
Greatest Common Divisors and Prime Factorization: Greatest common divisors, The Euclidean algorithm, The fundamental theorem of arithmetic, Factorization of integers and the Fermat numbers
Congruences: Introduction to congruences, Linear congruences, The Chinese remainder theorem, Systems of linear congruences

UNIT - II
Simple Linear Regression and Correlation: Introduction to Linear Regression, The Simple Linear Regression Model, Least Squares and the Fitted Model, Properties of the Least Squares Estimators, Inferences Concerning the Regression Coefficients, Prediction, Simple Linear Regression Case Study
Random Variables and Probability Distributions: Concept of a Random Variable, Discrete Probability Distributions, Continuous Probability Distributions, Statistical Independence.
Discrete Probability Distributions: Binomial Distribution, Poisson distribution.

UNIT - III
Continuous Probability Distributions: Normal Distribution, Areas under the Normal Curve, Applications of the Normal Distribution, Normal Approximation to the Binomial
Fundamental Sampling Distributions: Random Sampling, Sampling Distributions, Sampling Distribution of Means and the Central Limit Theorem, Sampling Distribution of S2, t -Distribution, F-Distribution.

UNIT - IV
Estimation & Tests of Hypotheses: Introduction, Statistical Inference, Classical Methods of 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 - V
Stochastic Processes and Markov Chains: Introduction to Stochastic processes- Markov process. Transition Probability, Transition Probability Matrix, First order and Higher order Markov process, nstep transition probabilities, Markov chain, Steady state condition, Markov analysis.

TEXT BOOKS:
1. Kenneth H. Rosen, Elementary number theory & its applications, sixth edition, Addison-Wesley, ISBN 978 0-321-50031-1
2. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers.
3. S. D. Sharma, Operations Research, Kedarnath and Ramnath Publishers, Meerut, Delhi

REFERENCE BOOK:
1. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications
2. T.T. Soong, Fundamentals of Probability And Statistics For Engineers, John Wiley & Sons Ltd, 2004.
3. Sheldon M Ross, Probability and statistics for Engineers and scientists, Academic Press.

M241ACSM302: DATA STRUCTURES

B.Tech. II Year I Sem.

TEACHING SCHEME		
L	T/P	C
3	0/0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

L T P C

3 0 0 3

Prerequisites: Programming for Problem Solving

Course Objectives
- Exploring basic data structures such as stacks and queues.
- Introduces a variety of data structures such as hash tables, search trees, tries, heaps, graphs.
- Introduces sorting and pattern matching algorithms

Course Outcomes

CO-1: Ability to select the data structures that efficiently model the information in a problem.

CO-2 : Ability to assess efficiency trade-offs among different data structure implementations or com binations.

CO-3 Implement and know the application of algorithms for sorting and pattern matching.

C0-4 Design programs using a variety of data structures, including hash tables, binary and generaltree structures, search trees, tries, heaps, graphs, and AVL-trees.

CO:5: Explain the advanced Data Structures Pattern matching Algoritham.

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	3	2	1				1	1	1		2	1
CO2	3	2	2	2	1				1	1	1		2	1
CO3	3	2	3	2	1				1	1	1		2	1
CO4	3	2	2	2	1				1	1	1		2	1
CO5	3	2	2	2	1				1	1	1		2	1

UNIT - I
Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, Stacks- Operations, array and linked representations of stacks, stack applications, Queues- operations, array and linked representations.

UNIT - II
Dictionaries: linear list representation, skip list representation, operations - insertion, deletion and searching.
Hash Table Representation: hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing.

UNIT - III
Search Trees: Binary Search Trees, Definition, Implementation, Operations- Searching, Insertion and Deletion, B- Trees, B+ Trees, AVL Trees, Definition, Height of an AVL Tree, Operations - Insertion, Deletion and Searching, Red -Black, Splay Trees.

UNIT - IV
Sorting Techniques: Quick Sort, Heap Sort, Merge Sort
 Graphs Algorithms Elementary Graph Algorithms: Topological sort, Single Source Shortest Path Algorithms: Dijkstra's, Bellman-Ford, All-Pairs Shortest Paths: Floyd-Warshall's Algorithm.

UNIT - V
Pattern Matching and Tries: Pattern matching algorithms-Brute force, the Boyer -Moore algorithm, the Knuth-Morris-Pratt algorithm, Standard Tries, Compressed Tries, Suffix tries.

TEXT BOOKS:
1. Fundamentals of Data Structures in C, 2 nd Edition, E. Horowitz, S. Sahni and Susan Anderson Freed, Universities Press.
2. Data Structures using C - A. S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson Education.

REFERENCE BOOK:
1. Data Structures: A Pseudocode Approach with C, 2 nd Edition, R. F. Gilberg and B.A.Forouzan, Cengage Learning.

M241ACSM303: COMPUTER ORGANIZATION AND ARCHITECTURE

B.Tech. II Year I Sem.

TEACHING SCHEME		
L	T/P	C
3	0/0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

L T P C

3 0 0 3

Co-requisite: A Course on "Digital Electronics".

Course Objectives

- The purpose of the course is to introduce principles of computer organization and the basic architectural concepts.
- It begins with basic organization, design, and programming of a simple digital computer and introduces simple register transfer language to specify various computer operations.
- Topics include computer arithmetic, instruction set design, microprogrammed control unit, pipelining and vector processing, memory organization and I/O systems, and multiprocessors

Course Outcomes

CO-1 Understand the basics of instruction sets and their impact on processor design.

CO-2 : Demonstrate an understanding of the design of the functional units of a digital computer system.

CO-3 Evaluate cost performance and design trade-offs in designing and constructing a

computerprocessor including memory.

CO-4: Design a pipeline for consistent execution of instructions with minimum hazards.

CO-5: Recognize and manipulate representations of numbers stored in digital computers

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	3				2						1	2	3
CO2	2	3	2	3	2	2					2	1	3	3
CO3	3	3		3								1	3	3
CO4	2	3		2	3	2	2					1	2	3
CO5	2	3		2	3	2	2				3	1	3	3

UNIT - I

Digital Computers: Introduction, Block diagram of Digital Computer, Definition of Computer Organization, Computer Design and Computer Architecture.

Register Transfer Language and Micro operations: Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit.

Basic Computer Organization and Design: Instruction codes, Computer Registers Computer instructions, Timing and Control, Instruction cycle, Memory Reference Instructions, Input - Output and Interrupt.

UNIT - II

Microprogrammed Control: Control memory, Address sequencing, micro program example, design of control unit.

Central Processing Unit: General Register Organization, Instruction Formats, Addressing modes, Data Transfer and Manipulation, Program Control.

UNIT - III

Data Representation: Data types, Complements, Fixed Point Representation, Floating Point Representation.

Computer Arithmetic: Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations. Decimal Arithmetic unit, Decimal Arithmetic operations.

UNIT - IV

Input-Output Organization: Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt Direct memory Access.

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associate Memory, Cache Memory.

UNIT - V

Reduced Instruction Set Computer: CISC Characteristics, RISC Characteristics.

Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processor.

Multi Processors: Characteristics of Multiprocessors, Interconnection Structures, Interprocessor arbitration, Interprocessor communication and synchronization, Cache Coherence.

TEXT BOOK:

1. Computer System Architecture – M. Morris Mano, Third Edition, Pearson/PHI.

REFERENCE BOOKS:

1. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, V th Edition, McGraw Hill.
2. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.
3. Structured Computer Organization – Andrew S. Tanenbaum, 4 th Edition, PHI/Pearson.

M241ACSM304: SOFTWARE ENGINEERING

B.Tech. II Year I Sem.

TEACHING SCHEME		
L	T/P	C
3	0/0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

L T P C
3 0 0 3

Course Objectives
- The aim of the course is to provide an understanding of the working knowledge of the techniques for estimation, design, testing and quality management of large software development projects.
- Topics include process models, software requirements, software design, software testing, software process/product metrics, risk management, quality management and UML diagrams

Course Outcomes

CO-1: Ability to translate end-user requirements into system and software requirements, using e.g.UML, and structure the requirements in a Software Requirements Document (SRD).

CO-2:Identify and apply appropriate software architectures and patterns to carry out high level designof a system and be able to critically compare alternative choices.

CO-3: Will have experience and/or awareness of testing problems and will be able to develop a simple testing report

CO-4: Deliver quality software products by applying software testing strategies and product metrics over the entire system life cycle

 CO-5: Specify contemporary issues of handling risk management and quality management in software development

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	3	2	2	2	2	1	1	1	1	2	1	3	3
CO2	3	3	3	2	3	2	1	1	1	1	2	1	3	3
CO3	3	3	2	2	2	2	1	1	1	1	2	1	3	3
CO4	3	3	2	2	3	2	3	1	1	1	2	1	3	3
CO5	3	3	2	2	3	2	3	1	1	1	2	1	3	3

UNIT - I
Introduction to Software Engineering: The evolving role of software, changing nature of software, software myths. **A Generic view of process**: Software engineering- a layered technology, a process framework, the capability maturity model integration (CMMI). **Process models**: The waterfall model, Spiral model and Agile methodology

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
Design Engineering: Design process and design quality, design concepts, the design model. Creating an architectural design: software architecture, data design, architectural styles and patterns, architectural design, conceptual model of UML, basic structural modeling, class diagrams, sequence diagrams, collaboration diagrams, use case diagrams, component diagrams.

UNIT - IV
Testing Strategies: A strategic approach to software testing, test strategies for conventional software, black-box and white-box testing, validation testing, system testing, the art of debugging. Metrics for Process and Products: Software measurement, metrics for software quality.

UNIT - V
Risk management: Reactive Vs proactive risk strategies, software risks, risk identification, risk projection, risk refinement, RMMM. **Quality Management:** Quality concepts, software quality assurance, software reviews, formal technical reviews, statistical software quality assurance, software reliability, the ISO 9000 quality standards.

TEXT BOOKS:
1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, McGraw Hill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson Education.

REFERENCE BOOKS:
1. The unified modeling language user guide Grady Booch, James Rambaugh, Ivar Jacobson, Pearson Education.
2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiley.
3. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.
4. Fundamentals of object-oriented design using UML Meiler page-Jones: Pearson Education.

M241ACSM305: OPERATING SYSTEMS

B.Tech. II Year I Sem.

TEACHING SCHEME		
L	T/P	C
3	0/0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

L T P C

3 0 0 3

Prerequisites:
1. A course on "Computer Programming and Data Structures".
2. A course on "Computer Organization and Architecture".

Course Objectives:
- Introduce 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, interprocess communication and I/O in Unix

Course Outcomes:
CO:1: Will be able to control access to a computer and the files that may be shared

CO-2: Demonstrate the knowledge of the components of computers and their respective roles incomputing.

CO-3: Ability to recognize and resolve user problems with standard operating environments.

CO-4: Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.

CO-5 Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	1	2	1	1	1	1	1		1	1	3	1	
CO2	3	1	2	1	1	1	1	1		1	1	3	1	
CO3	3	1	2	1	1	1	1	1		1	1	3	1	
CO4	3	1	2	1	1	1	1	1		1	1	3	1	
CO5	3	1	2	1	1	1	1	1		1	1	3	1	

UNIT - I
Operating System - Introduction, Structures - Simple Batch, Multiprogrammed, Time-shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, System components, Operating System services, System Calls
Process - Process concepts and scheduling, Operations on processes, Cooperating Processes, Threads

UNIT - II
CPU Scheduling - Scheduling Criteria, Scheduling Algorithms, Multiple -Processor Scheduling. System call interface for process management-fork, exit, wait, waitpid, exec
Deadlocks - System Model, Deadlocks Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock

UNIT - III
Process Management and Synchronization - The Critical Section Problem, Synchronization Hardware, Semaphores, and Classical Problems of Synchronization, Critical Regions, Monitors
Interprocess Communication Mechanisms: IPC between processes on a single computer system, IPC between processes on different systems, using pipes, FIFOs, message queues, shared memory.

UNIT - IV
Memory Management and Virtual Memory - Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging, Demand Paging, Page Replacement, Page Replacement Algorithms.

UNIT - V
File System Interface and Operations -Access methods, Directory Structure, Protection, File System Structure, Allocation methods, Free-space Management. Usage of open, create, read, write, close, lseek, stat, ioctl system calls.

Case Study: Windows Operating system, Linux Operating System

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.

REFERENCE BOOKS:
1. Operating Systems- Internals and Design Principles, William 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.

M241ACSM306: INTRODUCTION TO DATA STRUCTURES LAB

B.Tech. II Year I Sem.   **L T P C**
                                                                                          0 0 2 1

TEACHING SCHEME		
L	T/P	C
0	0/ 2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

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:
>   **CO.-1:**Ability to develop C programs for computing and real-life applications using basic
> elements likecontrol statements, arrays, functions, pointers and strings,
>   **CO-2:**Ability to Implement searching and sorting algorithms
>   **CO-**3:Implement linear data structures such as Stacks and Queues using array and linked-list
> representations.
>   **CO-**4: Implement non linear data structures such as trees and graphs.
  CO-5: implement data structures like stacks, queues and linked lists

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific
Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	1	2	1	2	1				1	1	1	2	2	1
CO2	2	2	1	2	1				1	1	1	1	2	1
CO3	2	2	1	2	1				1	1	1	1	2	1
CO4	2	2	1	2	1				1	1	1	1	2	1
CO5	2	2	2	2	1				1	2	1	1	2	1

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   iv) Traversal
3.   Write a program that uses functions to perform the following operations on circular linked
      list.:
           i) Creation   ii) Insertion   iii) Deletion   iv) Traversal
4.   Write a program that implement stack (its operations) using
           i) Arrays   ii) Pointers
5.   Write a program that implement Queue (its operations) using
           i) Arrays   ii) Pointers
6.   Write a program that implements the following sorting methods to sort a given list of integers

in ascending order
     i) Quick sort   ii) Heap sort   iii) Merge sort
7. Write a program to implement the tree traversal methods(Recursive and Non Recursive).
8. Write a program to implement
    i) Binary Search tree   ii) B Trees   iii) B+ Trees   iv)   AVL
    trees   v) Red - Black trees
9. Write a program to implement the graph traversal methods.
10. Implement a Pattern matching algorithms using Boyer- Moore, Knuth-Morris-Pratt

TEXT BOOKS:
1. Fundamentals of Data Structures in C, 2nd Edition, E. Horowitz, S. Sahni and Susan Anderson
    Freed, Universities Press.
2. Data Structures using C - A. S. Tanenbaum, Y. Langsam, and M. J. Augenstein, PHI/Pearson
    Education.

REFERENCE BOOK:
1. Data Structures: A Pseudocode Approach with C, 2nd Edition, R. F. Gilberg and B. A. Forouzan,
    Cengage Learning.

M241ACSM307: OPERATING SYSTEMS LAB

B.Tech. II Year I Sem.

L T P C
0 0 2 1

TEACHING SCHEME

L	T/P	C
0	0/2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

Prerequisites: A course on "Programming for Problem Solving", A course on "Computer Organization and Architecture".

Co-requisite: A course on "Operating Systems".

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, interprocess communication and I/O in Unix

Course Outcomes:

CO-1: Know the basic system calls related to process

 CO-2: Simulate CPU scheduling algorithms

CO-3: Understand memory management and virtual memory techniques

CO-4: Analyse the various disk scheduling algorithms

CO-5: Understand file management techniques

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	1	1	1				3	1	1	3		
CO2	3	2	1	1	1				3	1	1	3		
CO3	3	2	1	1	1				3	1	1	3		
CO4	3	2	1	1	1				3	1	1	3		
CO5	3	2	1	1	1				3	1	1	3		

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 operating system (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 semaphores using 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

7. Write C programs to simulate Page replacement policies a) FCFS b) LRU c) Optimal

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.

REFERENCE BOOKS:
1. Operating Systems - Internals and Design Principles, William 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

B.Tech. II Year I Sem.   **L   T   P   C**
                                                                                              0   0   2   1

M241ACSM308: SOFTWARE ENGINEERING LAB

TEACHING SCHEME		
L	T/P	C
0	0/2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

Prerequisites
- A course on "Programming for Problem Solving".

Co-requisite
- A Course on "Software Engineering".

Course Objectives:
- To have hands on experience in developing a software project by using various software engineering principles and methods in each of the phases of software development.

Course Outcomes:
  CO-1 Ability to translate end-user requirements into system and software requirements
  CO-2: Ability to generate a high-level design of the system from the software requirements
  CO-3: Will have experience and/or awareness of testing problems and will be able to develop asimple testing report

  CO-4: Develop the application for identified scenarios using CASE tools

  CO-5: Demonstrate the application through presentation after thorough testing using testing techniques

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	3	2	3	3	3	3	2	2	2	2	1	3	3
CO2	3	3	2	3	3	3	3	2	2	2	2	1	3	3
CO3	3	3	3	3	3	3	3	2	2	2	2	1	3	3
CO4	3	3	2	3	3	3	3	2	2	2	2	3	3	3
CO5	2	2	2	2	2	2	2	2	3	3	3	1	1	1

List of Experiments

Do the following seven exercises for any two projects given in the list of sample projects or any other Projects:

1. Development of problem statements.
2. Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.
3. Preparation of Software Configuration Management and Risk Management related documents.
4. Study and usage of any Design phase CASE tool
5. Performing the Design by using any Design phase CASE tools.
6. Develop test cases for unit testing and integration testing
7. Develop test cases for various white box and black box testing techniques.

Sample Projects:
1. Passport automation System
2. Book Bank
3. Online Exam Registration
4. Stock Maintenance System
5. Online course reservation system
6. E-ticketing
7. Software Personnel Management System
8. Credit Card Processing
9. E-book management System.
10. Recruitment system

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

REFERENCE BOOKS:
1. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiley.
2. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill

M241ACSM309: NODE JS/ REACT JS/ DJANGO

B.Tech. II Year I Sem.   **L T P C**
                                                                                          0 0 2 1

TEACHING SCHEME		
L	T/P	C
0	0/2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

Prerequisites: Object Oriented Programming through Java, HTML Basics

Course Objectives:
- To implement the static web pages using HTML and do client side validation using JavaScript.
- To design and work with databases using Java
- To develop an end to end application using java full stack.
- To introduce Node JS implementation for server side programming.
- To experiment with single page application development using React.

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

CO-1: Build a custom website with HTML, CSS, and Bootstrap and little JavaScript.
CO-2: Demonstrate Advanced features of JavaScript and learn about JDBC
CO-3: Develop Server - side implementation using Java technologies like
CO-4: Develop the server - side implementation using Node JS.
CO-5: Design a Single Page Application using React.

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	1	1		2	1	1	2	3	1
CO2	3	3	2	2	2	1	1		2	1	1	2	2	1
CO3	3	2	3	3	2	1	1		2	1	1	1	2	2
CO4	3	2	2	2	2	1	1		2	1	1	1	1	1
CO5	3	2	1	2	2	1	1		2	1	1	2	1	1

Exercises:
1. Build a responsive web application for shopping cart with registration, login, catalog and cart pages using CSS3 features, flex and grid.
2. Make the above web application responsive web application using Bootstrap framework.
3. Use JavaScript for doing client - side validation of the pages implemented in experiment 1 and experiment 2.
4. Explore the features of ES6 like arrow functions, callbacks, promises, async/await. Implement an application for reading the weather information from openweathermap.org and display the information in the form of a graph on the web page.
5. Develop a java stand alone application that connects with the database (Oracle / mySql) and perform the CRUD operation on the database tables.
6. Create an xml for the bookstore. Validate the same using both DTD and XSD.
7. Design a controller with servlet that provides the interaction with application developed in experiment 1 and the database created in experiment 5.

8. Maintaining the transactional history of any user is very important. Explore the various session tracking mechanism (Cookies, HTTP Session)
9. Create a custom server using http module and explore the other modules of Node JS like OS, path, event.
10. Develop an express web application that can interact with REST API to perform CRUD operations on student data. (Use Postman)
11. For the above application create authorized end points using JWT (JSON Web Token).
12. Create a react application for the student management system having registration, login, contact, about pages and implement routing to navigate through these pages.
13. Create a service in react that fetches the weather information from openweathermap.org and the display the current and historical weather information using graphical representation using chart.js
14. Create a TODO application in react with necessary components and deploy it into github.

REFERENCE BOOKS:

1. Jon Duckett, Beginning HTML, XHTML, CSS, and JavaScript, Wrox Publications, 2010
2. Bryan Basham, Kathy Sierra and Bert Bates, Head First Servlets and JSP, O'Reilly Media, 2nd Edition, 2008.
3. Vasan Subramanian, Pro MERN Stack, Full Stack Web App Development with Mongo, Express, React, and Node, 2nd Edition, A Press.

* M241ACSM310: CONSTITUTION OF INDIA

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

TEACHING SCHEME		
L	T/P	C
3	0/0	0

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

Course Objectives: Students will be able to:
- Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
- To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.
- To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.

Course Outcomes: Students will be able to:
CO-1: Discuss the growth of the demand for civil rights in India for the bulk of Indians before thearrival of Gandhi in Indian politics.
CO-2: Discuss the intellectual origins of the framework of argument that informed theconceptualization of social reforms leading to revolution in India.
CO-3: Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP]under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
CO-4: Discuss the passage of the Hindu Code Bill of 1956.
CO-5: Discuss: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	1					2	2	3		2	1	1	1	1
CO2	1					3	2	3		1	1	1	1	1
CO3	1					2	2	3		2	1	1	2	1
CO4	1					3	2	3		1	1	1	1	1
CO5	1					2	2	3		2	1	1	1	1

Unit - 1 History of Making of the Indian Constitution- History of Drafting Committee.
Unit - 2 Philosophy of the Indian Constitution- Preamble Salient Features
Unit - 3 Contours of Constitutional Rights & Duties - Fundamental Rights
- Right to Equality
- Right to Freedom
- Right against Exploitation
- Right to Freedom of Religion
- Cultural and Educational Rights
- Right to Constitutional Remedies
- Directive Principles of State Policy

* Fundamental Duties.

Unit - 4 Organs of Governance: Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions

Unit - 5 Local Administration: District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation. Panchayat raj: Introduction, PRI: Zila Panchayat. Elected officials and their roles, CEO ZilaPanchayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy

Unit - 6 Election Commission: Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.

Suggested Reading:
1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
3. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

M241ACSM401: DISCRETE STRUCTURES & GRAPH THEORY
B.Tech. II Year II Sem.   **L T P C**
                                                                          3 0 0 3

TEACHING SCHEME		
L	T/P	C
3	0/0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

Course Objectives:
- Introduces elementary discrete mathematics for computer science and engineering.
- Topics include formal logic notation, methods of proof, induction, sets, relations, algebraic structures, elementary graph theory, permutations and combinations, counting principles; recurrence relations and generating functions.

Course Outcomes:
> **CO-1:** Understand and construct and mathematical logic
> **CO-2**: explain the various fundamental concept of the set theory
> **CO-3:** Analyze and solve algebraic structures and identify and prove properties of groups
> **CO-4:** explain the oncept of functions and combinatiories
> **CO-5:** apply graph theory in solving computing problems

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	1	1								3	2	
CO2	3	2		1								3	2	
CO3	3	2	1	1								3	2	
CO4	3	2		1								3	2	
CO5	3	2	1	1								3	2	

UNIT - I
Mathematical logic: Introduction, Statements and Notation, Connectives, Normal Forms, Theory of Inference for the Statement Calculus, The Predicate Calculus, Inference Theory of the Predicate Calculus.

UNIT - II
Set theory: Introduction, Basic Concepts of Set Theory, Representation of Discrete Structures, Relations and Ordering, Functions.

UNIT - III
Algebraic Structures: Introduction, Algebraic Systems, Semi groups and Monoids, Lattices as Partially Ordered Sets, Boolean Algebra.

UNIT - IV
Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with Repetitions,

Enumerating Permutation with Constrained Repetitions, Binomial Coefficient, The Binomial and Multinomial Theorems, The Principle of Exclusion.

UNIT - V

Graph Theory: Basic Concepts, Isomorphism and Subgraphs, Trees and their Properties, Spanning Trees, Minimum spanning Tree-prim's and kruskal's algorithms Directed Trees, Binary Trees, Planar Graphs, Euler's Formula, Multi-graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

TEXT BOOKS:

1. Discrete Mathematical Structures with Applications to Computer Science: J.P. Tremblay, R. Manohar, McGraw-Hill, 1st ed.
2. Discrete Mathematics for Computer Scientists & Mathematicians: Joe l. Mott, Abraham Kandel, Teodore P. Baker, Prentis Hall of India, 2nd ed.

REFERENCE BOOKS:

1. Discrete and Combinatorial Mathematics - an applied introduction: Ralph.P. Grimald, Pearson education, 5th edition.
2. Discrete Mathematical Structures: Thomas Kosy, Tata McGraw Hill publishing co.

M241ACSM402: AUTOMATA THEORY AND COMPILER DESIGN

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

TEACHING SCHEME		
L	T/P	C
3	0/0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

Course Objectives

- To provide introduction to some of the central ideas of theoretical computer science from the perspective of formal languages.
- To introduce the fundamental concepts of formal languages, grammars and automata theory.
- Classify machines by their power to recognize languages.
- Employ finite state machines to solve problems in computing.
- To understand deterministic and non-deterministic machines.
- To understand the differences between decidability and undecidability.

Course Outcomes

CO-1: Understand the concept of abstract machines and their power to recognize the languages.
CO-2:: Employ finite state machines for modeling and solving computing problems.
CO-3: Design context free grammars for formal languages.
CO-4: Distinguish between decidability and undecidability.
CO-5: Solve Problems about Turing Machines

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	3	2					1	1		2	1	
CO2	3	2	3	2					1	1		2	1	
CO3	3	2	3	2					1	1		2	1	
CO4	3	2	3	2					1	1		2	1	
CO5	3	2	3	2					1	1		2	1	

UNIT - I
Introduction to Finite Automata: Structural Representations, Automata and Complexity, the Central Concepts of Automata Theory – Alphabets, Strings, Languages, Problems.
Nondeterministic Finite Automata: Formal Definition, an application, Text Search, Finite Automata with Epsilon-Transitions.
Deterministic Finite Automata: Definition of DFA, How A DFA Process Strings, The language of DFA, Conversion of NFA with €-transitions to NFA without €-transitions. Conversion of NFA to DFA, Moore and Melay machines

UNIT - II
Regular Expressions: Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic Laws for Regular Expressions, Conversion of Finite Automata to Regular Expressions.
Pumping Lemma for Regular Languages, Statement of the pumping lemma, Applications of the Pumping Lemma.
Closure Properties of Regular Languages: Closure properties of Regular languages, Decision

Properties of Regular Languages, Equivalence and Minimization of Automata.

UNIT - III

Context-Free Grammars: Definition of Context-Free Grammars, Derivations Using a Grammar, Leftmost and Rightmost Derivations, the Language of a Grammar, Sentential Forms, Parse Trees, Applications of Context-Free Grammars, Ambiguity in Grammars and Languages.

Push Down Automata: Definition of the Pushdown Automaton, the Languages of a PDA, Equivalence of PDA's and CFG's, Acceptance by final state, Acceptance by empty stack, Deterministic Pushdown Automata. From CFG to PDA, From PDA to CFG.

UNIT - IV

Normal Forms for Context- Free Grammars: Eliminating useless symbols, Eliminating €-Productions. Chomsky Normal form Greibach Normal form.

Pumping Lemma for Context-Free Languages: Statement of pumping lemma, Applications

Closure Properties of Context-Free Languages: Closure properties of CFL's, Decision Properties of CFL's Turing Machines: Introduction to Turing Machine, Formal Description, Instantaneous description, The language of a Turing machine

UNIT - V

Types of Turing machine: Turing machines and halting

Undecidability: Undecidability, A Language that is Not Recursively Enumerable, An Undecidable Problem That is RE, Undecidable Problems about Turing Machines, Recursive languages, Properties of recursive languages, Post's Correspondence Problem, Modified Post Correspondence problem, Other Undecidable Problems, Counter machines.

TEXT BOOKS:
1. Introduction to Automata Theory, Languages, and Computation, 3nd Edition, John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, Pearson Education.
2. Theory of Computer Science – Automata languages and computation, Mishra and Chandrashekaran, 2nd edition, PHI.

REFERENCE BOOKS:
1. Introduction to Languages and The Theory of Computation, John C Martin, TMH.
2. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
3. A Textbook on Automata Theory, P. K. Srimani, Nasir S. F. B, Cambridge University Press.
4. Introduction to the Theory of Computation, Michael Sipser, 3rd edition, Cengage Learning.
5. Introduction to Formal languages Automata Theory and Computation Kamala Krithivasan, Rama R, Pearson.

M241ACSM403: DATABASE MANAGEMENT SYSTEMS

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

TEACHING SCHEME		
L	T/P	C
3	0/0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

Prerequisites: A course on "Data Structures".
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, database design, relational model, relational algebra, transactioncontrol, concurrency control, storage structures and access techniques.

Course Outcomes:

CO-1: Gain knowledge of fundamentals of DBMS, database design and normal forms
CO-2: Master the basics of SQL for retrieval and management of data.
CO-3: Improve the database design by normalization
CO-4: Be acquainted with the basics of transaction processing and concurrency control.
CO-5: Familiarity with database storage structures and access techniques

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	1	3	2	3	2	2		1			1	2	3
CO2	2	2	3	3	3	2	3		1			2	2	3
CO3	2	3	1	3	1		2		1			1	3	3
CO4	3	2	1	1	1		3					1	2	2
CO5	2	2	1	1	1		3					2	2	2

UNIT - I
Database System Applications: A Historical Perspective, File Systems versus a DBMS, the Data Model, Levels of Abstraction in a DBMS, Data Independence, Structure of a 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 the ER Model
UNIT - II
Introduction to the Relational Model: Integrity constraint over relations, enforcing integrity constraints, querying relational data, logical database design, introduction to views, destroying/alteringtables and views.
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 databases.
Schema Refinement: Problems caused by redundancy, decompositions, problems related to

decomposition, reasoning about functional dependencies, First, Second, Third normal forms, BCNF, lossless join decomposition, multivalued dependencies, Fourth normal form, Fifth normal form.

UNIT - IV

Transaction Management: Transaction state, Implementation of atomicity and Durability, Concurrent executions - Serializability, Recoverability.

Concurrency Control: Lock Based Protocols, Timestamp Based Protocols, Validation Based Protocols, Multiple Granularity, Dead Lock Handling

Recoverability: Failure Classification, Storage Structure, Recovery and Atomicity- Log Based recovery, Recovery with concurrent transactions, Checkpoints.

UNIT - V

File Organization: Organization of records in file, Data Dictionary Storage.

Indexing and Hashing: Basic Concepts, Ordered Indices, B tree Index files, B+ tree index files, Static Hashing, Dynamic Hashing – Comparison of Indexing with Hashing.

TEXT BOOKS:

1. Database System Concepts, Silberschatz, Korth, Sudarshan, 7th Edition, McGraw-Hill
2. Introduction to Database Systems, C. J. Date, Pearson Education

REFERENCES:

1. Database Management Systems, Raghu Ramakrishnan, Johannes Gehrke, TataMcGraw-Hill
2. Fundamentals of Database Systems, Elmasri Navathe, Pearson Education
3. Database Systems Design, Implementation, and Management, Peter Rob & CarlosCoronel, 7th Edition, Cengage Learning

M241ACSM404: INTRODUCTION TO ARTIFICIAL INTELLIGENCE

B.Tech. II Year II Sem.

L	T	P	C
3	0	0	3

TEACHING SCHEME		
L	T/P	C
3	0/0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

Prerequisite: Knowledge on Data Structures.

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 machinelearning.

Course Outcomes:

CO-1: Learn the distinction between optimal reasoning Vs human like reasoning and formulate an efficient problem space for a problem expressed in natural language. Also select a search algorithm for a problem and estimate its time and space complexities.

CO-2: Apply AI techniques to solve problems of game playing, theorem proving, and machine learning.

CO-3 Learn different knowledge representation techniques.

CO-4: Understand the concepts of state space representation, exhaustive search, heuristic searchtogether with the time and space complexities.

CO-5: Comprehend the applications of Probabilistic Reasoning and Bayesian Networks.Analyze Supervised Learning Vs. Learning Decision Trees

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)												PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11		PSO1	PSO2	PSO3
CO1	3	3	3	2	1				1	1			2	1	1
CO2	3	3	3	2	1				1	2			2	1	1
CO3	3	3	3	2	1				1	2			2	2	
CO4	3	3	3	2	1				1	1			2	1	1
CO5	3	3	3	2	1				1	1			2	2	1

UNIT - I
Introduction to AI - Intelligent Agents, Problem-Solving Agents,
Searching for Solutions - Breadth-first search, Depth-first search, Hill-climbing search, Simulated annealing search, Local Search in Continuous Spaces.

UNIT-II
Games - Optimal Decisions in Games, Alpha-Beta Pruning, Defining Constraint Satisfaction Problems, Constraint Propagation, Backtracking Search for CSPs, Knowledge-Based Agents,
Logic- Propositional Logic, Propositional Theorem Proving: Inference and proofs, Proof by

resolution, Horn clauses and definite clauses.

UNIT-III
First-Order Logic - Syntax and Semantics of First-Order Logic, Using First Order Logic, Knowledge Engineering in First-Order Logic. Inference in First-Order Logic: Propositional vs. First-Order Inference,Unification, Forward Chaining, Backward Chaining, Resolution.
Knowledge Representation: Ontological Engineering, Categories and Objects, Events.

UNIT-IV
Planning - Definition of Classical Planning, Algorithms for Planning with State Space Search, Planning Graphs, other Classical Planning Approaches, Analysis of Planning approaches. Hierarchical Planning.

UNIT-V
Probabilistic Reasoning:
Acting under Uncertainty, Basic Probability Notation Bayes' Rule and Its Use, Probabilistic Reasoning, Representing Knowledge in an Uncertain Domain, The Semantics of Bayesian Networks, Efficient

Representation of Conditional Distributions, Approximate Inference in Bayesian Networks, Relationaland First- Order Probability.

TEXT BOOK:
1. Artificial Intelligence: A Modern Approach, Third Edition, Stuart Russell and Peter Norvig,Pearson Education.

REFERENCE BOOKS:
1. Artificial Intelligence, 3rd Edn., E. Rich and K. Knight (TMH)
2. Artificial Intelligence, 3rd Edn., Patrick Henny Winston, Pearson Education.
3. Artificial Intelligence, Shivani Goel, Pearson Education.
4. Artificial Intelligence and Expert systems – Patterson, Pearson Education.

M241ACSM405: OBJECT ORIENTED PROGRAMMING THROUGH JAVA

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

TEACHING SCHEME		
L	T/P	C
3	0/0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

Course Objectives

- To Understand the basic object-oriented programming concepts and apply them in problem solving.
- To Illustrate inheritance concepts for reusing the program.
- To Demonstrate multitasking by using multiple threads and event handling
- To Develop data-centric applications using JDBC.
- To Understand the basics of java console and GUI based programming

Course Outcomes

CO-1 :Demonstrate the behavior of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.
CO-2: Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords
CO-3 : Use multithreading concepts to develop inter process communication.
CO-4 :Understand the process of graphical user interface design and implementation using AWT or swings.
CO-5: Develop applets that interact abundantly with the client environment and deploy on the server.

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	3	3	2	2	2	2	2		1	3	2	1
CO2	3	2	2	2	2			2	1	1	1	2	1	2
CO3	3	2	3	2	2							2	2	2
CO4	3	3	2	2	2	2		1	1	1		3	2	1
CO5	3	3	2	2	3		2	1			1	3	2	2

UNIT - I

Object oriented thinking and Java Basics- Need for oop paradigm, summary of oop concepts, coping with complexity, abstraction mechanisms. A way of viewing world – Agents, responsibility, messages, methods, History of Java, Java buzzwords, data types, variables, scope and lifetime of variables, arrays, operators, expressions, control statements, type conversion and casting, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection,overloading methods and constructors, method binding, inheritance, overriding and exceptions, nested and inner classes, exploring string class.

UNIT - II

 Inheritance, Packages and Interfaces – Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. using final with inheritance, polymorphism- method overriding. Defining, Creating and Accessing a Package, Understanding

CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces,. Exploring java.io.

UNIT - III

Exception handling and Multithreading-- Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception subclasses. String handling, Exploring java.util. Differences between multithreading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication, thread groups, daemon threads. Enumerations, autoboxing, annotations, generics.

UNIT - IV

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, checkbox groups, choices,

lists panels - scrollpane, dialogs, menubar, graphics, layout manager - layout manager types - border, grid, flow, card and grid bag.

UNIT - V

Applets - Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets. Swing - Introduction, limitations of AWT, MVC architecture, 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, 7th edition, Herbert schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson education.

REFERENCE BOOKS:
1. An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch, John wiley & sons.
2. An Introduction to OOP, third edition, T. Budd, Pearson education.
3. Introduction to Java programming, Y. Daniel Liang, Pearson education.
4. An introduction to Java programming and object-oriented application development, R.A. Johnson- Thomson.
5. Core Java 2, Vol 1, Fundamentals, Cay.S. Horstmann and Gary Cornell, eighth Edition, Pearson Education.
6. Core Java 2, Vol 2, Advanced Features, Cay.S. Horstmann and Gary Cornell, eighth Edition, Pearson Education
7. Object Oriented Programming with Java, R.Buyya, S.T.Selvi, X.Chu, TMH.
8. Java and Object Orientation, an introduction, John Hunt, second edition, Springer. 9. Maurach's Beginning Java2 JDK 5, SPD.

M241ACSM406: DATABASE MANAGEMENT SYSTEMS LAB

B.Tech. II Year II Sem.

L T P C
0 0 2 1

TEACHING SCHEME		
L	T/P	C
0	0/2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

Co-requisites: "Database Management Systems"

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

Course Outcomes:

CO-1: Design database schema for a given application and apply normalization

CO-2:Acquire skills in using SQL commands for data definition and data manipulation.

C0-3:Develop solutions for database applications using procedures, cursors and triggers

CO-4: Applying PL/SQL for processing database

CO-5: Develop solutions using database concepts for real time requirements

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	1	3	3	2	1	2			2	2	2	2	3
CO2	3	1	3	3	1	1	2					3	2	3
CO3	2	1	2	3	1	1	2			2		3	2	3
CO4	3	2	2	3	1	1	2					3	2	3
CO5	3	2	3	3	1	1	2			3		3	3	3

List of Experiments:

1. Concept design with E-R Model
2. Relational Model
3. Normalization
4. Practicing DDL commands
5. Practicing DML commands
6. A. Querying (using ANY, ALL, UNION, INTERSECT, JOIN, Constraints etc.)
   B. Nested, Correlated subqueries
7. Queries using Aggregate functions, GROUP BY, HAVING and Creation and dropping of Views.
8. Triggers (Creation of insert trigger, delete trigger, update trigger)
9. Procedures
10. Usage of Cursors

TEXT BOOKS:

1. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata Mc Graw Hill, 3rd Edition
2. Database System Concepts, Silberschatz, Korth, McGraw Hill, V edition.

REFERENCE BOOKS:

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th

Edition.
2. Fundamentals of Database Systems, Elmasri Navrate, Pearson Education
3. Introduction to Database Systems, C.J. Date, Pearson Education
4. Oracle for Professionals, The X Team, S. Shah and V. Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
6. Fundamentals of Database Management Systems, M. L. Gillenson, Wiley Student Edition.

M241ACSM407: JAVA PROGRAMMING LAB

B.Tech. II Year II Sem.   **L T P C**
                                                                                 0 0 2 1

TEACHING SCHEME		
L	T/P	C
0	0/2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

Course Objectives:
- To understand OOP principles.
- To understand the Exception Handling mechanism.
- To understand Java collection framework.
- To understand multithreaded programming.
- To understand swing controls in Java.

Course Outcomes:
CO-1: Able to write programs for solving real world problems using the java collection framework.
CO-2: Able to write programs using abstract classes.
CO-3 :Able to write multithreaded programs.
CO-4: Able to write GUI programs using swing controls in Java.
CO-5: Develop java application connect database using JDBC

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	3	2	3		2			2		1	3	3	2
CO2	3	2	3	2					2	1		3	3	2
CO3	3	3	2	3					2		2	2	2	2
CO4	3	2	3	2	2	2	2		2	1	2	3	3	2
CO5	3	2	2	2	3	2	2	1	2	1	1	3	3	3

List of Experiments:
1. Use Eclipse or Net bean platform and acquaint yourself 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.

2. Write a Java program to demonstrate the OOP principles. [i.e., Encapsulation, Inheritance, Polymorphism and Abstraction]

3. Write a Java program to handle checked and unchecked exceptions. Also, demonstrate the usage of custom exceptions in real time scenario.

4. Write a Java program on Random Access File class to perform different read and write operations.

5. Write a Java program to demonstrate the working of different collection classes. [Use package structure to store multiple classes].

6. Write a program to synchronize the threads acting on the same object. [Consider the example of any reservations like railway, bus, movie ticket booking, etc.]

7. Write a program to perform CRUD operations on the student table in a database using JDBC.

8. 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.

9. 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]

REFERENCE BOOKS:
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, Pearson.

M241ACSM409: PROLOG/ LISP/ PYSWIP

L P T C
0 0 2 1

B.Tech. II Year II Sem.

TEACHING SCHEME		
L	T/P	C
0	0/2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

CO-1 Solve the distinction between optimal reasoning Vs human like reasoning and formulate an efficient problem space for a problem expressed in natural language. Also select a search algorithm for a problem and estimate its time and space complexities.

CO-2: Apply AI techniques to solve problems of game playing, theoremproving, and machine learning

CO-3: Demonistrate different knowledge representation techniques

CO-4: Understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities

C05: understand the applications of AI, namely game playing, theoremproving, and machine learning.

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	2	1	3	3	2	3	1	2	1
CO2	3	2	2	2	3	2	1	2	3	2	3	2	3	2
CO3	3	2	2	3	3	2	1	2	3	2	3	2	2	1
CO4	3		2		2	3	1	2	3	2	2	2	2	1
CO5	3	2	2	2	2	2	1	3	3	2	3	2	3	1

List of Programs:
1. Write simple fact for following:
    A. Ram likes mango.
    B. Seema is a girl.
    C. Bill likes Cindy.
    D. Rose is red.
    E. John owns gold

2. Write predicates one converts centigrade temperatures to Fahrenheit, the other checks if a temperature is below freezing.

3. Write a program to solve the Monkey Banana problem

4. WAP in turbo prolog for medical diagnosis and show the advantages and disadvantages of green and red cuts.

5. Write a program to solve the 4-Queen problem.

6. Write a program to solve traveling salesman problems.

7. Write a program to solve water jug problems using Prolog.

8. Write simple Prolog functions such as the following. Take into account lists which are too short.
    -- remove the Nth item from the list. -- insert as the Nth item.

9. Assume the prolog predicate gt(A, B) is true when A is greater than B. Use this predicate to define the predicate addLeaf(Tree, X, NewTree) which is true if NewTree is the Tree produced by adding the item X in a leaf node. Tree and NewTree are binary search trees. The empty tree is represented by the atom nil.

10. Write a Prolog predicate, countLists(Alist, Ne, Nl), using accumulators, that is true when Nl is the number of items that are listed at the top level of Alist and Ne is the number of empty lists. Suggestion: First try to count the lists, or empty lists, then modify by adding the other counter.

11. Define a predicate memCount(AList,Blist,Count) that is true if Alist occurs Count times within Blist. Define without using an accumulator. Use "not" as defined in utilities.pro, to make similar cases are unique, or else you may get more than one count as an answer.

    Examples:
    memCount(a,[b,a],N).
    N = 1 ;
    no
    memCount(a,[b,[a,a,[a],c],a],N).
    N = 4 ;
    no
    memCount([a],[b,[a,a,[a],c],a],N).
    N = 1 ;
    No

REFERENCE BOOK:
1. PROLOG: Programming for Artificial Intelligence, 3e, by BRATKO, WILEY

* M241AMC410: GENDER SENSITIZATION LAB

B.Tech. II Year II Sem.

L T P C
0 0 2 0

TEACHING SCHEME

L	T/P	C
0	0/2	0

EVALUATION SCHEME

D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE DESCRIPTION

This course offers an introduction to Gender Studies, an interdisciplinary field that asks critical questions about the meanings of sex and gender in society. The primary goal of this course is to familiarize students with key issues, questions and debates in Gender Studies, both historical and contemporary. It draws on multiple disciplines – such as literature, history, economics, psychology, sociology, philosophy, political science, anthropology and media studies - to examine cultural assumptions aboutsex, gender, and sexuality.

This course integrates analysis of current events through student presentations, aiming to increase awareness of contemporary and historical experiences of women, and of the multiple ways that sex and gender interact with race, class, caste, nationality and other social identities. This course also seeks tobuild an understanding and initiate and strengthen programmes combating gender-based violence and discrimination. The course also features several exercises and reflective activities designed to examine the concepts of gender, gender-based violence, sexuality, and rights. It will further explore the impact of gender-based violence on education, health and development.

Objectives of the Course

- 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.

Learning Outcomes

➢ 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 labor and its relation to politics and economics.

➢ Men and women students and professionals will be better equipped to work and live together as equals.

➢ Students will develop a sense of appreciation of women in all walks of life.

➢ Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

COURSE ARTICULATION MATRIX: (Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

	PROGRAM OUTCOMES(PO)											PROGRAM SPECIC OUTCOMES (PS0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	2	2	3	3							3	2	
CO2	1	1	2	2	3							2	2	
CO3	2	2	1	1	3						1	3	2	2
CO4	2	2	1	1	2						1	2	3	3
CO5	1	1	2	2	1						2	2	2	2

Unit-I: UNDERSTANDING GENDER

Introduction: Definition of Gender-Basic Gender Concepts and Terminology-Exploring Attitudes
towards Gender-Construction of Gender-Socialization: Making Women, Making Men
- Preparing for Womanhood. Growing up Male. First lessons in Caste.

Unit – II: GENDER ROLES AND RELATIONS

Two or Many? -Struggles with Discrimination-Gender Roles and Relations-Types of Gender Roles-
Gender Roles and Relationships Matrix-Missing Women-Sex Selection and Its Consequences-
Declining Sex Ratio. Demographic Consequences-Gender Spectrum: Beyond the Binary

Unit – III: GENDER AND LABOUR

Division and Valuation of Labour-Housework: The Invisible Labor- "My Mother doesn't Work."
"Sharethe Load."-Work: Its Politics and Economics -Fact and Fiction. Unrecognized and
Unaccounted work.
-Gender Development Issues-Gender, Governance and Sustainable Development-Gender and
Human Rights-Gender and Mainstreaming

Unit – IV: GENDER - BASED VIOLENCE

The Concept of Violence- Types of Gender-based Violence-Gender-based Violence from a Human
Rights Perspective-Sexual Harassment: Say No!-Sexual Harassment, not Eve-teasing- Coping with
Everyday Harassment- Further Reading: "*Chupulu"*.
Domestic Violence: Speaking OutIs Home a Safe Place? -When Women Unite [Film]. Rebuilding
Lives.Thinking about Sexual Violence Blaming the Victim-"I Fought for my Life...."

Unit – V: GENDER AND CULTURE

Gender and Film-Gender and Electronic Media-Gender and Advertisement-Gender and
PopularLiterature- Gender Development Issues-Gender Issues-Gender Sensitive Language-
Gender andPopular Literature - Just Relationships: Being Together as Equals
Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Rosa
Parks-The Brave Heart.

Note: **Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.**
  ➢ *Classes will consist of a combination of activities: dialogue-based lectures, discussions, collaborative learning activities, group work and in-class*

assignments.Apart from the above prescribed book, Teachers can make use of any authentic materials related to the topics given in the syllabus on "Gender".

- **ESSENTIAL READING**: The Textbook, "*Towards a World of Equals: A Bilingual Textbook on Gender*" written by A.Suneetha, Uma Bhrugubanda, DuggiralaVasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu **published by Telugu Akademi, Telangana Government in 2015.**

ASSESSMENT AND GRADING:
- Discussion & Classroom Participation: 20%
- Project/Assignment: 30%
- End Term Exam: 50%