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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI&ML)

I YEAR I SEMESTER

S. No.	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Internal (CIE)	External (SEE)	Total
1	MA101BS	Matrices and Calculus	3	1	0	4	40	60	100
2	AP102BS	Applied Physics	3	1	0	4	40	60	100
3	CS105ES	Programming for Problem Solving	3	0	0	3	40	60	100
4	ME107ES	Engineering Workshop	0	1	3	2.5	40	60	100
5	EN104HS	English for Skill Enhancement	2	0	0	2	40	60	100
6	CS106ES	Elements of Computer Science & Engineering	0	0	2	1	50	-	50
7	AP103BS	Applied Physics Laboratory	0	0	3	1.5	40	60	100
8	CS107ES	Programming for Problem Solving Laboratory	0	0	2	1	40	60	100
9	EN105HS	English Language and Communication Skills Laboratory	0	0	2	1	40	60	100
Total			**11**	**3**	**12**	**20**	**370**	**480**	**850**
10	*CH109MC	Environmental Science	3	0	0	0	100	-	100

I YEAR II SEMESTER

S. No.	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Internal (CIE)	External (SEE)	Total
1	MA201BS	Ordinary Differential Equations and Vector Calculus	3	1	0	4	40	60	100
2	CH202BS	Engineering Chemistry	3	1	0	4	40	60	100
3	ME208ES	Computer Aided Engineering Graphics	1	0	4	3	40	60	100
4	EE206ES	Basic Electrical Engineering	2	0	0	2	40	60	100
5	EC203ES	Electronic Devices and Circuits	2	0	0	2	40	60	100
6	CH204BS	Engineering Chemistry Laboratory	0	0	2	1	40	60	100
7	EE208ES	Basic Electrical Engineering Laboratory	0	0	2	1	40	60	100
8	CS205ES	Python Programming Laboratory	0	1	2	2	40	60	100
9	CS206ES	IT Workshop	0	0	2	1	40	60	100
Total			**11**	**3**	**12**	**20**	**360**	**540**	**900**

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II YEAR I SEMESTER

S. No.	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Internal (CIE)	External (SEE)	Total
1	MA303BS	Mathematical and Statistical Foundations	3	0	0	4	40	60	100
2	CS301PC	Data Structures	3	0	0	3	40	60	100
3	CS304PC	Computer Organization and Architecture	3	0	0	3	40	60	100
4	CS306PC	Software Engineering	3	0	0	3	40	60	100
5	CS305PC	Operating Systems	3	0	0	3	40	60	100
6	CS313PC	Introduction to Data Structures Lab	0	0	3	1	40	60	100
7	CS311PC	Operating Systems Lab	0	0	3	1	40	60	100
8	CSM308PC	Software Engineering Lab	0	0	2	1	40	60	100
9	CS312PC	Node JS/ React JS/Django	0	0	2	1	40	60	100
		Total	**15**	**0**	**10**	**20**	**360**	**540**	**900**
10	CI309MC	Constitution of India	3	0	0	0	100	-	100

II YEAR II SEMESTER

S. No.	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Internal (CIE)	External (SEE)	Total
1	CS401PC	Discrete Mathematics	3	0	0	3	40	60	100
2	CSM404PC	Automata Theory and Compiler Design	3	0	0	3	40	60	100
3	CS405PC	Database Management Systems	3	0	0	3	40	60	100
4	CSM406PC	Introduction to Artificial Intelligence	3	0	0	3	40	60	100
5	CS413PC	Object Oriented Programming through Java	3	0	0	3	40	60	100
6	CS407PC	Database Management Systems Lab	0	0	2	1	40	60	100
7	IT408PC	Java Programming Lab	0	0	2	1	40	60	100
8	CSM410PC	Real-time Research Project/Field-Based Research Project	0	0	4	2	50	-	50
9	CSM411PC	Prolog/ Lisp/ Pyswip	0	0	2	1	40	60	100
		Total	**15**	**0**	**10**	**20**	**370**	**480**	**850**
10	GS409MC	Gender Sensitization Lab	0	0	2	0	100	-	100

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

MATRICES AND CALCULUS

I B. TECH - I SEMESTER (R 22)								
Course Code	**Programme**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIE**	**SEE**	**Total**
MA101BS	**B. Tech**	**3**	**1**	**0**	**4**	**40**	**60**	**100**

COURSE OBJECTIVES

To learn

1. Types of matrices and their properties.
2. Concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
3. Concept of eigenvalues and eigenvectors and to reduce the quadratic form to canonical form
4. Geometrical approach to the mean value theorems and their application to the mathematical problems
5. Evaluation of surface areas and volumes of revolutions of curves.
6. Evaluation of improper integrals using Beta and Gamma functions.
7. Partial differentiation, concept of total derivative
8. Finding maxima and minima of function of two and three variables.
9. Evaluation of multiple integrals and their applications

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1. Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
2. Find the Eigenvalues and Eigen vectors
3. Reduce the quadratic form to canonical form using orthogonal transformations.
4. Solve the applications on the mean value theorems.
5. Evaluate the improper integrals using Beta and Gamma functions
6. Find the extreme values of functions of two variables with/ without constraints.
7. Evaluate the multiple integrals and apply the concept to find areas, volumes

UNIT-I	**MATRICES**	**Classes: 10**

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**	**Classes:10**

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**	**Classes:10**

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)**	**Classes: 10**

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)**	**Classes: 8**

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. Dr. D. Ranadheer Reddy, Mr. K Upender Reddy &Mr. G Chandra Mohan, A First Course in Linear Algebra and Calculus for Engineers, M/s StudentsHelpline Publishing House Pvt. Ltd, First Edition-2020.
2. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
3. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Editon, 2016.

REFERENCE BOOKS

1. Erwinkreyszig,AdvancedEngineeringMathematics,9th Edition,JohnWiley& Sons,2006.
2. G.B.ThomasandR.L.Finney,CalculusandAnalyticgeometry,9thEdition,Pearson,Reprint,2002.
3. N.P.BaliandManishGoyal,AtextbookofEngineeringMathematics,LaxmiPublications,Reprint,2008.
4. H.K.DassandEr.RajnishVerma,HigherEngineeringMathematics,SChandandCompanyLimited, NewDelhi.

WEB REFERENCES

1. https://www.efunda.com/math/gamma/index.cfm
2. https://ocw.mit.edu/resources/#Mathematics
3. https://www.sosmath.com/
4. https://www.mathworld.wolfram.com/

E -TEXT BOOKS

1. https://www.e-
2. booksdirectory.com/listing.php?category=4https://www.e-booksdirectory.com/details.php?ebook=10830

MOOCS COURSE

1. https://swayam.gov.in/
2. https://swayam.gov.in/NPTEL

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

APPLIED PHYSICS

I B. TECH - I SEMESTER (R 22)

Course Code	Programme	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
AP102BS	B. Tech	3	1	0	4	40	60	100

COURSE OBJECTIVES

To learn

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

Upon successful completion 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	Classes: 12

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	Classes: 14

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	Classes: 10

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	Classes: 12

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	Classes: 14

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. Dr. K. Venkanna and Dr. P. NageswarRao, Applied Physics, Seven Hills International Publishers, 2021.
2. M. N. Avadhanulu, P.G. Kshirsagar& TVS Arun Murthy" A Text book of Engineering Physics"-
3. S. Chand Publications, 11th Edition 2019.
4. Engineering Physics by Shatendra Sharma and Jyotsna Sharma, Pearson Publication,2019
5. Semiconductor Physics and Devices- Basic Principle – Donald A, Neamen, Mc Graw Hill, 4thEdition,2021.
6. B.K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning, 2ndEdition,2022.
7. 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, PragathiPrakashan, 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

WEB REFERENCES

1. Introductory QuantumMechanics: https://nptel.ac.in/courses/115104096/
2. Fundamental concepts of semiconductors:https://nptel.ac.in/courses/115102025/
3. SemiconductorOptoelectronics:https://nptel.ac.in/courses/115102103/
4. FibreOptics: https://nptel.ac.in/courses/115107095/

E -TEXT BOOKS

1. library genesis: https://libgen.is/

MOOCS COURSE

1. Swayam: https://swayam.gov.in/nd1_noc19_ph13/preview
2. Alison: https://alison.com/courses?&category=physics

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

PROGRAMMING FOR PROBLEM SOLVING

I B. TECH - I SEMESTER (R 22)

Course Code	Programme	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS105ES	B. Tech	3	0	0	3	40	60	100

COURSE OBJECTIVES

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

COURSE OUTCOMES

Upon successful completion of the course, the student is able

1. To write algorithms and to draw flowcharts for solving problems.
2. To convert the algorithms/flowcharts to C programs.
3. To code and test a given logic in the C programming language.
4. To decompose a problem into functions and to develop modular reusable code.
5. To use arrays, pointers, strings and structures to write C programs.
6. Searching and sorting problems.

UNIT-I	INTRODUCTION TO PROGRAMMING	Classes: 16

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	Classes: 14

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	Classes:10

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	Classes: 12

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	Classes: 12

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. YashavantKanetkar, 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

WEB REFERENCES

1. https://www.tutorialspoint.com/cprogramming/
2. https://www.tutorialspoint.com/cplusplus/
3. https://www.cprogramming.com/tutorial/c-tutorial.html

E -TEXT BOOKS

1. https://fresh2refresh.com/c-programming/
2. https://beginnersbook.com/2014/01/c-tutorial-for-beginners-with-examples/
3. https://www.sanfoundry.com/simple-c-programs/

MOOCS Course
1. nptel.ac.in/courses/106105085/4 2. https://www.quora.com/Are-IIT-NPTEL-videos-good-to-learn-basic-C-programming

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

ENGINEERING WORKSHOP

I B. TECH- I SEMESTER (R 22)

Course Code	Programme	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
ME107ES	B.Tech	0	1	3	2.5	40	60	100

COURSE OBJECTIVES

To learn

1. To Study of different hand operated power tools, uses and their demonstration.
2. To gain a good basic working knowledge required for the production of various engineering products.
3. To provide hands on experience about use of different engineering materials, tools, equipments and processes those are common in the engineering field.
4. To develop a right attitude, team working, precision and safety at workplace.
5. It explains the construction, function, use and application of different working tools, equipment and machines.
6. To study commonly used carpentry joints.
7. To have practical exposure to various welding and joining processes.
8. Identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances.

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1. Study and practice on machine tools and their operations
2. Practice on manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.
3. Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
4. Apply basic electrical engineering knowledge for house wiring practice.

LIST OF EXPERIMENTS

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

WEB REFERENCES

1. http://freevideolectures.com/Course/3420/Engineering-Drawing
2. https://www.slideshare.net/search/slideshow?searchfrom=header&q=engineering+drawing
3. https://www.wiziq.com/tutorials/engineering-drawing
4. http://road.issn.org/issn/2344-4681-journal-of-industrial-design-and-engineering-graphics

E -TEXT BOOKS

1. http://rgpv-ed.blogspot.com/2009/09/development-of-surfaces.html
2. http://www.techdrawingtools.com/12/l1201.htm

MOOCS Course

1. https://nptel.ac.in/course.php
2. https://swayam.gov.in/explorer

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

ENGLISH FOR SKILL ENHANCEMENT

I B. TECH - I SEMESTER (R 22)

Course Code	Programme	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
EN104HS	B. Tech	2	0	0	2	40	60	100

COURSE OBJECTIVES

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

Upon successful completion of the course, the student 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 Black Swan, 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 **'Approved' by Sudha Murthy** from***" English: Language, Context and Culture" published*** by Orient Black Swan, 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 Black Swan, 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 **'Artand Literature' by Abdul Kalam** from ***"English:Language ,Context and Culture "***published by Orient Black Swan, Hyderabad.

Vocabulary: Standard Abbreviations in English

Grammar: Redundancies and Clichés in Oraland Written Communication.

Reading: Survey, Question, Read, Recite and Review(SQ3RMethod)-Exercises for Practice

Writing: WritingPractices-EssayWriting-WritingIntroductionandConclusion-PrécisWriting.

UNIT - V

Chapter entitled **'Go, Kiss the World' by Subroto Bagchi** from ***"English:Language, Context and Culture"*** published by Orient Black Swan, 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 aReport

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 toadopt Blended Learning in dealing with the course contents .They are advised to teach 40percentofeachtopicfromthe syllabus in blended mode.

TEXT BOOKS

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.

WEB REFERENCES

1. Fundamental concepts of semi conductors: https://nptel.ac.in/courses/115102025/
2. Semi conductor Optoelectronics:https://nptel.ac.in/courses/115102103/

E -TEXT BOOKS

1. http://www.lehman.edu/faculty/kabat/F2019-166168.pdf
2. https://www.scribd.com/doc/143091652/ENGINEERING-PHYSICS-LAB-MANUAL

MOOCS COURSE

1. Swayam:https://swayam.gov.in/nd1_noc19_ph13/preview
2. Alison: https://alison.com/courses?&category=physics

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

ELEMENTS OF COMPUTER SCIENCE AND ENGINEERING

I B. TECH- I SEMESTER (R22)

Course Code	Programme	Hours /Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS106ES	B. Tech	0	0	2	1	50	-	50

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	Classes: 08

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	Classes: 08

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 AND DATABASE MANAGEMENT SYSTEMS	Classes: 08

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, WORLD WIDE WEB AND SECURITY	Classes: 08

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 AND CLOUD BASICS	Classes: 08

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

TEXT BOOKS

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, ReemaThareja, 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.

WEB REFERENCES

1. https://www.cs.utexas.edu/undergraduate-program/academics/elements-computing
2. https://www.degruyter.com/document/doi/10.1515/9780748626458-004/html?lang=en
3. https://mitpress.mit.edu/9780262640688/the-elements-of-computing-systems/
4. http://182.160.97.198:8080/xmlui/handle/123456789/965

E –TEXT BOOKS

1. https://www.pdfdrive.com/computer-science-engineering-books.html
2. https://www.ikbooks.com/subject/engineering-computer-science/115
3. https://www.degruyter.com/document/doi/10.1515/9780748626458-004/html?lang=en

MOOCS COURSE

1. https://www.computersciencezone.org/computer-science-education-free-with-moocs/
2. https://www.computerscience.org/resources/online-courses/
3. https://www.quora.com/What-are-the-good-MOOCs-in-computer-science
4. https://www.coursera.org/browse/computer-science

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

APPLIED PHYSICS LABORATORY

I B. TECH- I SEMESTER (R22)

Course Code	Programme	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
AP103BS	B. Tech	0	0	3	1.5	40	60	100

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 behaviour 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 behaviour of hysteresis curve.
5. Carried out data analysis.

LIST OF EXPERIMENTS

Note: Any 8 experiments are to be performed

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 Aperture of an optical fiber.
12. Understanding the method of least squares – torsional pendulum as an example.

TEXT BOOKS

1. P.K.Palaniswamy, Engineering Physics, SciTech Publications.

REFERENCE BOOKS
1. S. Balasubramanian, M.N. Srinivasan “A Text book of Practical Physics”- S Chand Publishers, 2017.
WEB REFERENCES
1. Introductory Quantum Mechanics: https://nptel.ac.in/courses/115104096/ 2. Fundamental concepts of semiconductors: https://nptel.ac.in/courses/115102025/ 3. SemiconductorOptoelectronics:https://nptel.ac.in/courses/115102103/ 4. Fibre Optics: https://nptel.ac.in/courses/115106095/
E – TEXT BOOK
1. library genesis: https://libgen.is/
MOOCS COURSE
1. Swayam: https://swayam.gov.in/nd1_noc19_ph13/preview 2. Alison :https://alison.com/courses?&Programme=physics

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

PROGRAMMING FOR PROBLEM SOLVING LABORATORY

I B. TECH- I SEMESTER (R22)

Course Code	Programme	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS107ES	B.Tech	0	0	2	1	40	60	100

COURSE OBJECTIVES: The students will learn the following:

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

COURSE OUTCOMES: The candidate is expected to be able to:

1. formulate the algorithms for simple problems
2. translate given algorithms to a working and correct program
3. correct syntax errors as reported by the compilers
4. identify and correct logical errors encountered during execution
5. represent and manipulate data with arrays, strings and structures
6. use pointers of different types
7. create, read and write to and from simple text and binary files
8. modularize the code with functions so that they can be reused

LIST OF EXPERIMENTS

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+…….. +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

WEB REFERENCES

1. Code Lite: https://codelite.org/ Code: Blocks: http://www.codeblocks.org/
2. Dev Cpp : http://www.bloodshed.net/devcpp.html Eclipse: http://www.eclipse.org

E -TEXT BOOKS

1. https://fresh2refresh.com/c-programming/
2. https://beginnersbook.com/2014/01/c-tutorial-for-beginners-with-examples/
3. https://www.sanfoundry.com/simple-c-programs/

MOOCS Course

1. nptel.ac.in/courses/106105085/4
2. https://www.quora.com/Are-IIT-NPTEL-videos-good-to-learn-basic-C-programming

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DEPARTMENT OF COMPUTR SCIENCE AND ENGINEERING

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LABORATORY

I B. TECH- I SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
EN105HS	B.Tech	0	0	2	1	40	60	100

COURSE OBJECTIVES

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

COURSE OUTCOMES: Students will be able to:

1. Understand the nuances of English language through audio- visual experience and group activities
2. Neutralise their accent for intelligibility

3.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

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

LIST OF EXPERIMENTS

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)

TEXT BOOKS

1.Exercises in Spoken English. Parts I – III. EFLU, Hyderabad. Oxford University Press.

2.English Language and Communication Skills Lab Manual, Spectrum Publications, 1st Edition, 2020.

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.

WEB REFERENCES

1.https://www.asha.org/PRPSpecificTopic.aspx?folderid=8589935321&section=References

2.Argyle, Michael F., Alkema, Florisse, & Gilmour, Robin. "The communication of friendly and hostile attitudes: Verbal and nonverbal signals." European Journal of Social Psychology, 1, 385- 402:1971

3.Blumer, Herbert. Symbolic interaction: Perspective and method. Engle wood Cliffs; NJ: Prentice Hall.1969

E -TEXT BOOKS

1. Mc corry Laurie Kelly Mc Corry Jeff Mason, Communication Skills for the Healthcare Professional, 1st edition, ISBN:1582558140, ISBN-13:9781582558141
2. Robert E Owens, Jr, Language Development, 9th edition, ISBN:0133810364, 9780133810363

MOOCS COURSES

1.https://www.coursera.org/specializations/improve-english

2.https://www.edx.org/professional-certificate/upvalenciax-upper-intermediate-english

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

ENVIRONMENTAL SCIENCE

I B. TECH - I SEMESTER (R 22)								
Course Code	**Programme**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIE**	**SEE**	**Total**
CH109MC	**B. Tech**	**3**	**0**	**0**	**0**	**100**	**-**	**100**

COURSE OBJECTIVES

To learn

1) Understanding the importance of ecological balance for sustainable development.
2) Understanding the impacts of developmental activities and mitigation measures.
3) Understanding the environmental policies and regulations

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1) 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**	**Classes: 10**

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**	**Classes:10**

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**	**Classes:10**

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**	**Classes: 10**

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

UNIT-V	**ENVIRONMENTAL POLICY, LEGISLATION & EIA**	**Classes: 8**

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. 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. Erwinkreyszig, Advanced Engineering Mathematics,9th Edition, John Wiley& Sons,2006.
2. G.B.Thomasand R.L.Finney,CalculusandAnalyticgeometry,9thEdition, Pearson,Reprint,2002.
3. N.P. Baliand Manish Goyal, A textbook of Engineering Mathematics, Laxmi Publications, Reprint,2008.
4. H.K. Dassand Er. Rajnish Verma,Higher Engineering Mathematics, S Chand and Company Limited , New Delhi.

WEB REFERENCES

1. https://www.efunda.com/math/gamma/index.cfm
2. https://ocw.mit.edu/resources/#Mathematics
3. https://www.sosmath.com/
4. https://www.mathworld.wolfram.com/

E -TEXT BOOKS

1. https://www.e-booksdirectory.com/listing.php?category=4https://www.e-booksdirectory.com/details.php?ebook=10830

MOOCS COURSE

1. https://swayam.gov.in/
2. https://swayam.gov.in/NPTEL

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)
ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

I B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
MA201BS	B. Tech	3	1	0	4	40	60	100

COURSE OBJECTIVES: To learn

1. Methods of solving the differential equations of first and higher order.
2. Concept, properties of Laplace transforms
3. Solving ordinary differential equations using Laplace transforms techniques.
4. The physical quantities involved in engineering field related to vector valued functions
5. The basic properties of vector valued functions and their applications to line, surface and volume integrals

COURSE OUTCOMES:

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

1. Identify whether the given differential equation of first order is exact or not
2. Solve higher differential equation and apply the concept of differential equation to real world problems.
3. Use the Laplace transforms techniques for solving ODE's.
4. Evaluate the line, surface and volume integrals and converting them from one to another

UNIT-I	FIRST ORDER ODE	Classes: 08

Exact differential equations, Equations reducible to exact differential equations, linear and Bernoulli's equations, Orthogonal Trajectories (only in Cartesian Coordinates). Applications: Newton's law of cooling, Law of natural growth and decay.

UNIT-II	ORDINARY DIFFERENTIAL EQUATIONS OF HIGHER ORDER	Classes: 10

Second order linear differential equations with constant coefficients: Non-Homogeneous terms of the type eax, sin ax , cos ax, polynomials in x, $eaxV(x)$ and $xV(x)$, method of variation of parameters, Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Euler equation. Applications: Electric Circuits

UNIT-III	LAPLACE TRANSFORMS	Classes:10

Laplace Transforms: Laplace Transform of standard functions, First shifting theorem, Second shifting theorem, Unit step function, Dirac delta function, Laplace transforms of functions when they are multiplied and divided by 't', Laplace transforms of derivatives and integrals of function, Evaluation of integrals by Laplace transforms, Laplace transform of periodic functions, Inverse Laplace transform by different methods, convolution theorem (without proof). Applications: solving Initial value problems by Laplace Transform method.

UNIT-IV	VECTOR DIFFERENTIATION	Classes: 10
Vector point functions and scalar point functions, Gradient, Divergence and Curl, Directional derivatives, Tangent plane and normal line, Vector Identities, Scalar potential functions, Solenoidal and Irrotational vectors.		
UNIT-V	**VECTOR INTEGRATION**	**Classes: 10**
Line, Surface and Volume Integrals, Theorems of Green, Gauss and Stokes (without proofs) and their applications.		

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 Edition, 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, 9th Edition, Pearson, Reprint, 2002.
3. H. K. Dass and Er. RajnishVerma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.
4. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.

WEB REFERENCES

1. https://www.efunda.com/math/gamma/index.cfm
2. https://ocw.mit.edu/resources/#Mathematics
3. https://www.sosmath.com/
4. https://www.mathworld.wolfram.com/

E -TEXT BOOKS

1. https://www.e-booksdirectory.com/listing.php?Programme=4
2. https://www.e-booksdirectory.com/details.php?ebook=10840

MOOCS COURSE

1. https://swayam.gov.in/
2. https://swayam.gov.in/NPTEL

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

ENGINEERING CHEMISTRY

I B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CH202BS	B. Tech	3	1	0	4	40	60	100

COURSE OBJECTIVES

To learn

1. To bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer.
2. To include the importance of water in industrial usage, fundamental aspects of battery chemistry, significance of corrosion it's control to protect the structures.
3. To imbibe the basic concepts of petroleum and its products.
4. To acquire required knowledge about engineering materials like cement, smart materials and Lubricants.

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1. Students will acquire the basic knowledge of electrochemical procedures related to corrosion and its control.
2. The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
3. They can learn the fundamentals and general properties of polymers and other engineering materials.
4. They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

UNIT-I	WATER AND ITS TREATMENT	Classes: 08

Introduction to hardness of water – Estimation of hardness of water by complexometric method and related numerical problems. Potable water and its specifications - Steps involved in the treatment of potable water - Disinfection of potable water by chlorination and break - point chlorination. Defluoridation - Determination of F- ion by ion- selective electrode method.

Boiler troubles: Sludges, Scales and Caustic embrittlement. Internal treatment of Boiler feed water - Calgon conditioning - Phosphate conditioning - Colloidal conditioning, External treatment methods - Softening of water by ion- exchange processes. Desalination of water – Reverse osmosis.

UNIT-II	BATTERY CHEMISTRY & CORROSION	Classes: 08

Introduction - Classification of batteries- primary, secondary and reserve batteries with examples. Basic requirements for commercial batteries. Construction, working and applications of: Zn-air and Lithium ion battery, Applications of Li-ion battery to electrical vehicles. Fuel Cells- Differences between battery and a fuel cell, Construction and applications of Methanol Oxygen fuel cell and Solid oxide fuel cell. Solar cells - Introduction and applications of Solar cells.

Corrosion: Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection – Sacrificial anode and impressed current methods.

UNIT-III	POLYMERIC MATERIALS	Classes: 08

Definition – Classification of polymers with examples – Types of polymerization – addition (free radical addition) and condensation polymerization with examples – Nylon 6:6, Terylene Plastics: Definition and characteristics- thermoplastic and thermosetting plastics, Preparation, Properties and engineering applications of PVC and Bakelite, Teflon, Fiber reinforced plastics (FRP). Rubbers: Natural rubber and its vulcanization.

Elastomers: Characteristics –preparation – properties and applications of Buna-S, Butyl and Thiokol rubber.

Conducting polymers: Characteristics and Classification with examples-mechanism of conduction in trans-polyacetylene and applications of conducting polymers.

Biodegradable polymers: Concept and advantages - Polylactic acid and poly vinyl alcohol and their applications.

UNIT-IV	ENERGY SOURCES	Classes: 08

Introduction, Calorific value of fuel – HCV, LCV- Dulongs formula. Classification- solid fuels: coal – analysis of coal – proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining, cracking types – moving bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol - Fischer-Tropsch's process; Gaseous fuels – composition and uses of natural gas, LPG and CNG, Biodiesel – Transesterification, advantages.

UNIT-V	ENGINEERING MATERIALS	Classes: 08

Cement: Portland cement, its composition, setting and hardening.

Smart materials and their engineering applications

Shape memory materials- Poly L- Lactic acid. Thermoresponse materials- Polyacryl amides, Poly vinyl amides

Lubricants: Classification of lubricants with examples-characteristics of a good lubricants - mechanism of lubrication (thick film, thin film and extreme pressure)- properties of lubricants: viscosity, cloud point, pour point, flash point and fire point.

TEXT BOOKS

8. Engineering Chemistry by P.C. Jain and M. Jain, Dhanpatrai Publishing Company, 2010
9. Engineering Chemistry by Rama Devi, VenkataRamana Reddy and Rath, Cengage learning, 2016
10. A text book of Engineering Chemistry by M. Thirumala Chary, E. Laxminarayana and K. Shashikala, Pearson Publications, 2021.
11. Textbook of Engineering Chemistry by Jaya Shree Anireddy, Wiley Publications.

REFERENCE BOOKS

8. Engineering Chemistry by Shikha Agarwal, Cambridge University Press, Delhi (2015)
9. Engineering Chemistry by Shashi Chawla, Dhanpatrai and Company (P) Ltd. Delhi (2011)

WEB REFERENCES

1. Chemistry: foundations and applications. J. J. Lagowski, editor in chief. New York, Macmillan Reference USA, c2004. 4v
2. Polymer data handbook. Edited by James E. Mark. 2nd ed. Oxford, New York, Oxford University Press, 2009
3. https://www.wyzant.com/resources/lessons/science/chemistry
4. http://www.chem1.com/acad/webtext/virtualtextbook.html

E -TEXT BOOKS

1. Krishnamurthy, N., Vallinayagam, P., Madhavan, D., Engineering Chemistry, ISBN: 9789389346005, eBook ISBN: 9789389346012, Edition: FourthEdition
2. Vijayasarathy, P. R., Engineering Chemistry, Print Book ISBN : 9789387472778, eBook ISBN : 9789387472785, Edition : Third Edition

MOOCS COURSE

1. https://onlinecourses-archive.nptel.ac.in
2. https://www.mooc-list.com/tags/chemistry

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

COMPUTER AIDED ENGINEERING GRAPHICS

I B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours /Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
ME208ES	B. Tech	1	0	4	3	40	60	100

COURSE OBJECTIVES:

1. To develop the ability of visualization of different objects through technical drawings
2. To acquire computer drafting skill for communication of concepts, ideas in the design of engineering products

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

1. Apply computer aided drafting tools to create 2D and 3D objects
2. sketch conics and different types of solids
3. Appreciate the need of Sectional views of solids and Development of surfaces of solids
4. Read and interpret engineering drawings
5. Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting

UNIT-I	INTRODUCTION TO ENGINEERING GRAPHICS	Classes: 08

Introduction to Engineering Graphics: Principles of Engineering Graphics and their Significance, Scales – Plain & Diagonal, Conic Sections including the Rectangular Hyperbola – General method only. Cycloid, Epicycloid and Hypocycloid, Introduction to Computer aided drafting – views, commands and conics

UNIT-II	ORTHOGRAPHIC PROJECTIONS	Classes: 08

Orthographic Projections: Principles of Orthographic Projections – Conventions – Projections of Points and Lines, Projections of Plane regular geometric figures. Auxiliary Planes. Computer aided orthographic projections – points, lines and planes

UNIT-III	PROJECTIONS OF REGULAR SOLIDS	Classes: 08

Projections of Regular Solids – Auxiliary Views - Sections or Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views, Computer aided projections of solids – sectional views

UNIT-IV	DEVELOPMENT OF SURFACES OF RIGHT REGULAR SOLIDS	Classes: 08

Development of Surfaces of Right Regular Solids – Prism, Cylinder, Pyramid and Cone, Development of surfaces using computer aided drafting

UNIT-V	ISOMETRIC PROJECTIONS	Classes: 08

Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of Spherical Parts. Conversion of Isometric Views to Orthographic Views and Vice-versa –Conventions. Conversion of orthographic projection into isometric view using computer aided drafting.

TEXTBOOKS

1. Engineering Drawing N.D. Bhatt / Charotar
2. Engineering Drawing and graphics Using AutoCAD Third Edition, T. Jeyapoovan, Vikas: S. Chand and company Ltd.

REFERENCEBOOKS

1. Engineering Drawing, Basant Agrawal and C M Agrawal, Third Edition McGraw Hill
2. Engineering Graphics and Design, WILEY, Edition 2020
3. Engineering Drawing, M. B. Shah, B.C. Rane / Pearson.
4. Engineering Drawing, N. S. Parthasarathy and Vela Murali, Oxford
5. Computer Aided Engineering Drawing – K Balaveera Reddy et al – CBS Publishers

WEBREFERENCES

1. https://sites.google.com/site/gecbtechcse/home/semester-i-ii/caeg
2. https://me113.cankaya.edu.tr/course.php?page=References

E –TEXTBOOKS

1. https://www.pdfdrive.com/me-113-computer-aided-engineering-drawing-e1640645.html
2. https://www.pdfdrive.com/computer-aided-engineering-design-e25770024.html
3. https://www.technicalbookspdf.com/computer-aided-engineering-design/

MOOCSCOURSE

1. https://www.mooc-list.com/tags/computer-graphics
2. https://www.my-mooc.com/en/mooc/computer-graphics-uc-san-diegox-cse167x-1/
3. https://www.columbiacollege.ca/programs/course/apsc-151/

Note: - External examination is conducted in conventional mode and internal evaluation to be done bybothconventional aswellasusing computeraided drafting.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

BASIC ELECTRICAL ENGINEERING

I B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours /Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
EE206ES	B. Tech	2	0	0	2	40	60	100

COURSE OBJECTIVES

To learn

1. To understand DC and Single & Three phase AC circuits
2. To study and understand the different types of DC, AC machines and Transformers.
3. To import the knowledge of various electrical installations and the concept of power, power factor and its improvement.

COURSE OUTCOMES

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

1. Understand and analyze basic Electrical circuits
2. Study the working principles of Electrical Machines and Transformers
3. Introduce components of Low Voltage Electrical Installations.

UNIT-I	D.C. CIRCUITS	Classes: 08

D.C. Circuits: Electrical circuit elements (R, L and C), voltage and current sources, KVL&KCL, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits.

UNIT-II	A. C. CIRCUITS	Classes: 08

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

UNIT-III	TRANSFORMERS	Classes: 08

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

UNIT-IV	ELECTRICAL MACHINES	Classes: 08

Electrical Machines: Construction and working principle of dc machine, performance characteristics of dc shunt machine. Generation of rotating magnetic field, Construction and working of a three-phase induction motor, Significance of torque-slip characteristics. Single-phase induction motor, Construction and working. Construction and working of synchronous generator.

UNIT-V	ELECTRICAL INSTALLATION	Classes: 08

Electrical Installations: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

TEXTBOOKS

1. D.P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 4th Edition, 2019.
2. MS Naidu and S Kamakshaiah, "Basic Electrical Engineering", Tata McGraw Hill, 2nd Edition, 2008.

REFERENCEBOOKS

1. P. Ramana, M. Suryakalavathi, G.T. Chandrasheker, "Basic Electrical Engineering", S. Chand, 2nd Edition, 2019.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009
3. M. S. Sukhija, T. K. Nagsarkar, "Basic Electrical and Electronics Engineering", Oxford, 1st Edition, 2012.
4. Abhijit Chakrabarthi, Sudipta Debnath, Chandan Kumar Chanda, "Basic Electrical Engineering", 2nd Edition, McGraw Hill, 2021.
5. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
6. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
7. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989

WEBREFERENCES

1. https://www.electrical4u.com/
2. http://www.basicsofelectricalengineering.com/
3. https://www.khanacademy.org/science/physics/circuits-topic/circuits-resistance/a/ee-voltage-and-current
4. https://circuitglobe.com/

E –TEXTBOOKS

1. https://easyengineering.net/basic-electrical-engineering-by-wadhwa/
2. https://easyengineering.net/objective-electrical-technology-by-mehta/

MOOCSCOURSE

1. https://nptel.ac.in/courses/108108076/1
2. https://nptel.ac.in/courses/108102146/
3. https://nptel.ac.in/courses/108108076/35

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

ELECTRONIC DEVICES AND CIRCUITS

I B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
EC203ES	B. Tech	2	0	0	2	40	60	100

COURSE OBJECTIVES:

1. To introduce components such as diodes, BJTs and FETs.
2. To know the applications of devices.
3. To know the switching characteristics of devices.

Course Outcomes: Upon completion of the Course, the students will be able to:

1. Acquire the knowledge of various electronic devices and their use on real life.
2. Know the applications of various devices.
3. Acquire the knowledge about the role of special purpose devices and their applications.

UNIT - I	**DIODES**	**Classes:**

Diodes: Diode - Static and Dynamic resistances, Equivalent circuit, Diffusion and Transition Capacitances, V-I Characteristics, Diode as a switch- switching times.

UNIT - II	**DIODE APPLICATIONS**	**Classes:**

Diode Applications: Rectifier - Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, Rectifiers with Capacitive and Inductive Filters, Clippers-Clipping at two independent levels, Clamper-Clamping Circuit Theorem, Clamping Operation, Types of Clampers.

UNIT - III	**BIPOLAR JUNCTION TRANSISTOR**	**Classes:**

Bipolar Junction Transistor (BJT): Principle of Operation, Common Emitter, Common Base and Common Collector Configurations, Transistor as a switch, switching times.

UNIT - IV	**JUNCTION FIELD EFFECT TRANSISTOR**	**Classes:**

Junction Field Effect Transistor (FET): Construction, Principle of Operation, Pinch-Off Voltage, Volt-Ampere Characteristic, Comparison of BJT and FET, FET as Voltage Variable Resistor, MOSFET, MOSTET as a capacitor.

UNIT - V	**SPECIAL PURPOSE DEVICES**	**Classes:**

Special Purpose Devices: Zener Diode - Characteristics, Zener diode as Voltage Regulator, Principle of Operation - SCR, Tunnel diode, UJT, Varactor Diode, Photo diode, Solar cell, LED, Schottky diode.

TEXT BOOKS

1. Jacob Millman - Electronic Devices and Circuits, McGraw Hill Education
2. Robert L. Boylestead, Louis Nashelsky- Electronic Devices and Circuits theory, 11th Edition, 2009, Pearson.

REFERENCE BOOKS

1. Horowitz -Electronic Devices and Circuits, David A. Bell – 5thEdition, Oxford.
2. Chinmoy Saha, Arindam Halder, Debaati Ganguly - Basic Electronics-Principles and Applications, Cambridge, 2018.

WEB REFERENCES

1. Analog Electronics Authors- L.K. MAHESWARI, M.M.S.ANAND. 2009
2. Electronic Communication System Author- Kennedy
3. Integrated Electronics Analog And Digital & System Author – Jacob Millman. Christos C. Halkias
4. https://www.analog.com › education › education-library › tutorials

E -TEXT BOOKS

1. The Scientist & Engineer's Guide to Digital Signal Processing, 1999
2. Application-Specific Integrated Circuits Michael J. Smith

MOOCS COURSE

1. https://www.mooc-list.com › tags › analogue-electronics
2. https://www.mooc-list.com › course › electronic-systems-and-digital-electronics

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

PYTHON PROGRAMMING LABORATORY

I B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS205ES	B. Tech	0	1	2	2	40	70	100

COURSE OBJECTIVES

1. To install and run the Python interpreter
2. To learn control structures.
3. To Understand Lists, Dictionaries in python
4. To Handle Strings and Files in Python

COURSE OUTCOMES: After completion of the course, the student should be able to

1. Develop the application specific codes using python.
2. Understand Strings, Lists, Tuples and Dictionaries in Python
3. Verify programs using modular approach, file I/O, Python standard library
4. Implement Digital Systems using Python

WEEK - I

1. i) Use a web browser to go to the Python website http://python.org. This page contains information about Python and links to Python-related pages, and it gives you the ability to search the Python documentation.

ii) Start the Python interpreter and type help() to start the online help utility.

2.Start a Python interpreter and use it as a Calculator.

3.i)Write a program to calculate compound interest when principal, rate and number of periods are given.

ii)Given coordinates (x1, y1), (x2, y2) find the distance between two points

4. Read name, address, email and phone number of a person through keyboard and print the details.

WEEK - II

1. Print the below triangle using for loop. 5

```
4 4
3 3 3
2 2 2 2
1 1 1 1 1
```

2. Write a program to check whether the given input is digit or lowercase character or uppercase character or a special character (use 'if-else-if' ladder)

3.Python Program to Print the Fibonacci sequence using while loop

4.Python program to print all prime numbers in a given interval (use break)

WEEK - III

1. i) Write a program to convert a list and tuple into arrays.
   ii) Write a program to find common values between two arrays.
2. Write a function called gcd that takes parameters a and b and returns their greatest common divisor.
3. Write a function called palindrome that takes a string argument and returns True if it is a palindrome and False otherwise. Remember that you can use the built-in function len to check the length of a string.

WEEK - IV		

1. Write a function called is_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.
2. Write a function called has_duplicates that takes a list and returns True if there is any element that appears more than once. It should not modify the original list.
   i).Write a function called remove_duplicates that takes a list and returns a new list with only the unique elements from the original. Hint: they don't have to be in the same order.
   ii).The wordlist I provided, words.txt, doesn't contain single letter words. So you might want to add "I", "a", and the empty string.
   iii).Write a python code to read dictionary values from the user. Construct a function to invert its content. i.e., keys should be values and values should be keys.
3. i) Add a comma between the characters. If the given word is 'Apple', it should become 'A,p,p,l,e'
   ii) Remove the given word in all the places in a string?
   iii) Write a function that takes a sentence as an input parameter and replaces the first letter of every word with the corresponding upper case letter and the rest of the letters in the word by corresponding letters in lower case without using a built-in function?
4. Writes a recursive function that generates all binary strings of n-bit length

WEEK - V		

1. i) Write a python program that defines a matrix and prints
   ii)Write a python program to perform addition of two square matrices
   iii)Write a python program to perform multiplication of two square matrices
2. How do you make a module? Give an example of construction of a module usingdifferent geometrical shapes and operations on them as its functions.
3. Use the structure of exception handling all general purpose exceptions.

WEEK - VI		

1. a. Write a function called draw_rectangle that takes a Canvas and a Rectangle as arguments and draws a representation of the Rectangle on the Canvas.
   b. Add an attribute named color to your Rectangle objects and modify draw_rectangle so that it uses the color attribute as the fill color.
   c. Write a function called draw_point that takes a Canvas and a Point as arguments and draws a representation of the Point on the Canvas.
   d. Define a new class called Circle with appropriate attributes and instantiate a few Circle objects. Write a function called draw_circle that draws circles on the canvas.
2. Write a Python program to demonstrate the usage of Method Resolution Order (MRO) in multiple levels of Inheritances.
3. Write a python code to read a phone number and email-id from the user and validate it for correctness.

WEEK - VII		

1. Write a Python code to merge two given file contents into a third file.
2. Write a Python code to open a given file and construct a function to check for given words present in it and display on found.

3. Write a Python code to Read text from a text file, find the word with most number of occurrences
4. Write a function that reads a file file1 and displays the number of words, number of vowels, blank spaces, lower case letters and uppercase letters.

WEEK - VIII		

1. Import numpy, Plotpy and Scipy and explore their functionalities.
2. a) Install NumPy package with pip and explore it.
3. Write a program to implement Digital Logic Gates – AND, OR, NOT, EX-OR
4. Write a program to implement Half Adder, Full Adder, and Parallel Adder
5. Write a GUI program to create a window wizard having two text labels, two text fields and two buttons as Submit and Reset.

TEXT BOOKS

1. Supercharged Python: Take your code to the next level, Overland
2. Learning Python, Mark Lutz, O'reilly

REFERENCE BOOKS

1. Python Programming: A Modern Approach, VamsiKurama, Pearson
2. Python Programming A Modular Approach with Graphics, Database, Mobile, and Web Applications, SheetalTaneja, Naveen Kumar, Pearson
3. Programming with Python, A User's Book, Michael Dawson, Cengage Learning, India Edition
4. Think Python, Allen Downey, Green Tea Press
5. Core Python Programming, W. Chun, Pearson
6. Introduction to Python, Kenneth A. Lambert, Cengage

WEB REFERENCES

1. https://swayam.gov.in/nd1_noc19_cs41/preview
2. https://swayam.gov.in/nd1_noc19_mg47/preview
3. https://swayam.gov.in/nd1_noc19_cs40/preview

E -TEXT BOOKS

1. https://www.tutorialspoint.com/python3/
2. https://www.youtube.com/watch?v=Dl_dz1FOvcY&list=PLHT9VxUGxZRshJ-edzjLZ72HfSta8s5f
3. https://www.udemy.com/machine-learning-using-r-and-python/
4. https://www.udemy.com/r-programming-language/
5. https://www.simpliv.com/itcertification/data-analytics-using-r-programming
6. https://books.goalkicker.com/PythonBook/

MOOCS COURSE

1. https://www.coursera.org/learn/python-programming
2. https://www.edx.org/professional-certificate/python-data-science
3. https://www.edx.org/course/cs50s-web-programming-with-python-and-javascript
4. https://www.programiz.com/python-programming/regex
5. https://www.tutorialspoint.com/python3/
6. https://www.geeksforgeeks.org/cgi-programming-python/
7. https://realpython.com/python-beginner-tips/
8. https://www.python.org/

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

ENGINEERING CHEMISTRY LABORATORY

I B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CH204BS	B.Tech	0	0	2	1	40	60	100

COURSE OBJECTIVES:

The course consists of experiments related to the principles of chemistry required for engineering student. The student will learn:

1. Estimation of hardness of water to check its suitability for drinking purpose.
2. Students are able to perform estimations of acids and bases using conductometry, potentiometry and pH metry methods.
3. Students will learn to prepare polymers such as Bakelite and nylon-6 in the laboratory.
4. Students will learn skills related to the lubricant properties such as saponification value, surface tension and viscosity of oils.

COURSE OUTCOMES: The experiments will make the student gain skills on:

1. Determination of parameters like hardness of water and rate of corrosion of mild steel in various conditions.
2. Able to perform methods such as conductometry, potentiometry and pH metry in order to find out the concentrations or equivalence points of acids and bases.
3. Students are able to prepare polymers like bakelite and nylon-6.
4. Estimations saponification value, surface tension and viscosity of lubricant oils.

LIST OF EXPERIMENTS

I. Volumetric Analysis: Estimation of Hardness of water by EDTA Complexometry method.
II. Conductometry: Estimation of the concentration of an acid by Conductometry.
III. Potentiometry: Estimation of the amount of Fe+2 by Potentiomentry.
IV. pH Metry: Determination of an acid concentration using pH meter.
V. Preparations:
   1.Preparation of Bakelite.
   2.Preparation Nylon – 6.
VI.Lubricants:
   1.Estimation of acid value of given lubricant oil.
   2.Estimation of Viscosity of lubricant oil using Ostwald's Viscometer.
VII.Corrosion: Determination of rate of corrosion of mild steel in the presence and absence of inhibitor.
VIII.Virtual lab experiments
   1.Construction of Fuel cell and its working.
   2.Smart materials for Biomedical applications

3.Batteries for electrical vehicles.
4.Functioning of solar cell and its applications.

TEXT BOOKS

7. Engineering Chemistry by P.C. Jain and M. Jain, Dhanpatrai Publishing Company, 2010
8. Engineering Chemistry by Rama Devi, VenkataRamana Reddy and Rath, Cengage learning, 2016
9. A text book of Engineering Chemistry by M. Thirumala Chary, E. Laxminarayana and K. Shashikala, Pearson Publications, 2021.
10. Textbook of Engineering Chemistry by Jaya Shree Anireddy, Wiley Publications.

REFERENCE BOOKS

1. Lab manual for Engineering chemistry by B. Ramadevi and P. Aparna, S Chand Publications, New Delhi (2022)
2. Vogel's text book of practical organic chemistry 5th edition
3. Inorganic Quantitative analysis by A.I. Vogel, ELBS Publications.
4. College Practical Chemistry by V.K. Ahluwalia, Narosa Publications Ltd. New Delhi (2007).

WEB REFERENCES

2. Chemistry: foundations and applications. J. J. Lagowski, editor in chief. New York, Macmillan Reference USA, c2004. 4v
3. Polymer data handbook. Edited by James E. Mark. 2nd ed. Oxford, New York, Oxford
4. University Press, 2009
5. https://www.wyzant.com/resources/lessons/science/chemistry
6. http://www.chem1.com/acad/webtext/virtualtextbook.html

E -TEXT BOOKS

8. Krishnamurthy, N., Vallinayagam, P., Madhavan, D., Engineering Chemistry, ISBN: 9789389346005, eBook ISBN: 9789389346012, Edition: Fourth Edition
9. Vijayasarathy, P. R., Engineering Chemistry, Print Book ISBN : 9789387472778, eBook ISBN : 9789387472785, Edition : Third Edition

MOOCS Course

1. https://onlinecourses-archive.nptel.ac.in.
2. https://www.mooc-list.com/tags/chemistry.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

BASIC ELECTRICAL ENGINEERING LABORATORY

I B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours /Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
EE208ES	B. Tech	0	0	2	1	40	60	100

COURSE OBJECTIVES:

1. To measure the electrical parameters for different types of DC and AC circuits using conventional and theorems approach.
2. To study the transient response of various R, L and C circuits using different excitations.
3. To determine the performance of different types of DC, AC machines and Transformers.

COURSE OUTCOMES: After learning the contents of this paper the student must be able to

1. Verify the basic Electrical circuits through different experiments.
2. Evaluate the performance calculations of Electrical Machines and Transformers through various testing methods.
3. Analyze the transient responses of R, L and C circuits for different input conditions.

LIST OF EXPERIMENTS / DEMONSTRATIONS

PART- A (compulsory)

1.Verification of KVL and KCL
2. Verification of Thevenin's and Norton's theorem
3. Transient Response of Series RL and RC circuits for DC excitation
4. Resonance in series RLC circuit
5. Calculations and Verification of Impedance and Current of RL, RC and RLC series circuits
6. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single-Phase Transformer
7. Performance Characteristics of a DC Shunt Motor
8. Torque-Speed Characteristics of a Three-phase Induction Motor.

PART-B (any two experiments from the given list)

1. Verification of Superposition theorem.
2. Three Phase Transformer: Verification of Relationship between Voltages and Currents (Star-Delta, Delta-Delta, Delta-star, Star-Star)
3. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation)
4. Measurement of Active and Reactive Power in a balanced Three-phase circuit
5. No-Load Characteristics of a Three-phase Alternator

TEXTBOOKS

1. D.P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 4th Edition, 2019.
2. MS Naidu and S Kamakshaiah, “Basic Electrical Engineering”, Tata McGraw Hill, 2nd Edition, 2008.

REFERENCEBOOKS

1. P. Ramana, M. Suryakalavathi, G.T.Chandrasheker,”Basic Electrical Engineering”, S. Chand, 2nd Edition, 2019.
2. D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill, 2009
3. M. S. Sukhija, T. K. Nagsarkar, “Basic Electrical and Electronics Engineering”, Oxford, 1st Edition, 2012.
4. Abhijit Chakrabarthi, Sudipta Debnath, Chandan Kumar Chanda, “Basic Electrical Engineering”, 2nd Edition, McGraw Hill, 2021.
5. L. S. Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press, 2011.
6. E. Hughes, “Electrical and Electronics Technology”, Pearson, 2010.
7. V. D. Toro, “Electrical Engineering Fundamentals”, Prentice Hall India, 1989.

WEBREFERENCES

1. https://www.electrical4u.com/
2. http://www.basicsofelectricalengineering.com/
3. https://www.khanacademy.org/science/physics/circuits-topic/circuits-resistance/a/ee-voltage-and-current
4. https://circuitglobe.com/

E –TEXTBOOKS

1. https://easyengineering.net/basic-electrical-engineering-by-wadhwa/
2. https://easyengineering.net/objective-electrical-technology-by-mehta/

MOOCSCOURSE

1. https://nptel.ac.in/courses/108108076/1
2. https://nptel.ac.in/courses/108102146/
3. https://nptel.ac.in/courses/108108076/35

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DEPARTMENT OF COMPUTR SCIENCE AND ENGINEERING

IT WORKSHOP

I B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS206ES	B. Tech	0	0	2	1	40	60	100

COURSE OBJECTIVES

The IT Workshop for engineers is a training lab course spread over 60 hours.

1. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, PowerPoint and Publisher.

COURSE OUTCOMES

1. Perform Hardware troubleshooting
2. Understand Hardware components and inter dependencies
3. Safeguard computer systems from viruses/worms
4. Document/ Presentation preparation
5. Perform calculations using spreadsheets

LIST OF EXPERIMENTS

PC Hardware

Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both Windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Internet & World Wide Web

Task1: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there isno internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task 2: Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

Task 3: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Task 4: Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

LaTeX and WORD

Task 1 – Word Orientation: The mentor needs to give an overview of LaTeX and Microsoft (MS) office or equivalent (FOSS) tool word: Importance of LaTeX and MS office or equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using LaTeX

and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Task 2: Using LaTeX and Word to create a project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

Task 3: Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task 4: Creating a Newsletter: Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

Excel

Excel Orientation: The mentor needs to tell the importance of MS office or equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1: Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, Formatting Text

Task 2: Calculating GPA - .Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP

Task 3: Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

Powerpoint

Task 1: Students will be working on basic power point utilities and tools which help them create basic powerpoint presentations. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in PowerPoint.

Task 2: Interactive presentations - Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and

Charts.

Task 3: Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), and Inserting – Background, textures, Design Templates, Hidden slides.

TEXT BOOKS

1. Textbook Of Workshop Technology RsKhurmiJk Gupta

REFERENCE BOOKS

1. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech
2. The Complete Computer upgrade and repair book, 3rd edition Cheryl A Schmidt, WILEY Dreamtech
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. PC Hardware - A Handbook – Kate J. Chase PHI (Microsoft)
5. LaTeX Companion – Leslie Lamport, PHI/Pearson.
6. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme. – CISCO Press, Pearson Education.
7. IT Essentials PC Hardware and Software Labs and Study Guide Third Edition by Patrick Regan– CISCO Press, Pearson Education.

WEB REFERENCES

1. LATEX- User's Guide and Reference Manual, Leslie Lamport, Pearson, Second Edition LPE.

E -TEXT BOOKS

1. Foundations of Information Technology Coursebook 9: Windows 7 and MS Office 2007 (With MS Office 2010 Updates)-SangeetaPanchal,Alka Sabharwal.
2. Dell Ms Office 2003-Diane Koers.

MOOCS COURSES

1. https://store.self-publish.in › products › a-textbook-of-workshop-technology

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)
MATHEMATICAL AND STATISTICAL FOUNDATIONS

II B. TECH-I SEMESTER (R22)								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIE**	**SEE**	**Total**
MA303BS	**B. Tech**	**3**	**1**	**0**	**4**	**40**	**60**	**100**

COURSE OBJECTIVES

To learn

1. The Number Theory basic concepts useful for cryptography etc
2. The theory of Probability and probability distributions of single and multiple random variables
3. The sampling theory and Estimating Parameters
4. Testing of hypothesis and making inferences
5. Stochastic process and Markov chains.

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1. Apply the number theory concepts to cryptography domain.
2. Apply the concepts of probability and distributions to some case studies.
3. Correlate the material of one unit to the material in other units.
4. Estimating a Proportion of single mean and difference of means
5. Resolve the potential misconceptions and hazards in each topic of study.

UNIT-I	**GREATEST COMMON DIVISORS AND PRIME FACTORIZATION**	**Classes: 8**

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 AND RANDOM VARIABLES AND PROBABILITY DISTRIBUTIONS**	**Classes: 8**

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 AND FUNDAMENTAL SAMPLING DISTRIBUTIONS	Classes:8

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	Classes: 8

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	Classes: 8

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. Dr.D.Ranadheer Reddy, Mrs. G. Vanaja and Mr.G.Chandra Mohan, 'Mathematical and Statistical Foundations', Amaravathi Publishers, First Edition, 2021. ISBN: 978-81-953687-2-3
2. Kenneth H. Rosen, Elementary number theory & its applications, sixth edition, Addison- Wesley, ISBN 978 0-321-50031-1.
3. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers.
4. S. D. Sharma, Operations Research, Kedarnath and Ramnath Publishers, Meerut, Delhi

REFERENCE BOOKS

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.

WEB REFERENCES

1. https://www.efunda.com/math/gamma/index.cfm
2. https://ocw.mit.edu/resources/#Mathematics
3. https://www.sosmath.com/
4. https://www.mathworld.wolfram.com/

E -TEXT BOOKS

1. https://www.e-booksdirectory.com/listing.php?category=4
2. https://www.e-booksdirectory.com/details.php?ebook=10830

MOOCS COURSE

1. https://swayam.gov.in/
2. https://swayam.gov.in/NPTEL

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

DATA STRUCTURES

II B. TECH- I SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS301PC	B. Tech	3	0	0	3	40	60	100

COURSE OBJECTIVES

To learn

1. Exploringbasicdatastructuressuchasstacksandqueues.
2. A variety of data structures such as hash tables, search trees,tries, heaps,graphs
3. Sorting and pattern matchingalgorithms

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1. Ability to select the data structures that efficiently model the information in a problem.
2. Ability to assess efficiency trade-offs among different data structure implementations or combinations.
3. Implement and know the application of algorithms for sorting and pattern matching
4. Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.
5. Implementandknowtheapplicationofalgorithms inGraph Traversal methods.

UNIT-I	INTRODUCTION TO DATA STRUCTURES	Classes: 12

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 linkedrepresentations of stacks, stack applications, Queues-operations, array and linked representations.

UNIT-II	DICTIONARIES AND HASH TABLE	Classes: 12

Dictionaries: Linear list representation, skip list representation, operations - insertion, deletion andsearching.

Hash Table Representation: Hash functions, collision resolution-separate chaining, open addressing linear probing, quadratic probing, double hashing, rehashing, extendible hashing.

UNIT-III	SEARCH TREES	Classes: 10
Search Trees: Binary Search Trees, Definition, Implementation, Operations- Searching, Insertion andDeletion, AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching, Red –Black, Splay Trees.		
UNIT-IV	**GRAPHS AND SORTING**	**Classes: 12**
Graphs: Graph Implementation Methods. Graph Traversal Methods. **Sorting**: Quick Sort, Heap Sort, External Sorting- Model for external sorting, Merge Sort..		
UNIT-V	**PATTERN MATCHING AND TRIES**	**Classes: 12**
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. Dr.P.Santhosh Kumar Patra, Dr.R.Nagaraju, Mr. C. Yosepu, Mr.A.Mruthyunjayam and Mr. P.Ganesh Kumar, ' Data Structures using C', S International Publishers, First Edition, 2021. ISBN: 978-81-952679-6-5.
2. Fundamentals of Data Structures in C, 2 nd Edition, E. Horowitz, S. Sahni and Susan Anderson Freed, Universities Press.
3. Data Structures using C – A. S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson Education.

REFERENCE BOOKS

1. Data Structures: A Pseudocode Approach with C, 2nd Edition, R. F. Gilberg and B.A. Forouzan,Cengage Learning.
2. Classic Data Structures, D. Samanta, 2nd edition,PHI.

WEB REFERENCES

1. Alfred Aho, John Hopcroft, and Jeffrey Ullman, Data Structures andAlgorithms, Addison-Wesley, 1983, ISBN0-201-00023-7.
2. https://www.studytonight.com/data-structures/introduction-to-data-structures
3. https://nptel.ac.in/courses/106/102/106102064/

E -TEXT BOOKS

1. Peter Brass, Advanced Data Structures, Cambridge University Press, 2008, ISBN 978-0521880374
2. G. H. Gonnetand R. Baeza-Yates, Handbook of Algorithms and Data Structures - inPascal and C, second edition, Addison-Wesley, 1991, ISBN0-201-41607-7.

MOOCS COURSES

1. https://www.udemy.com/data-structures-and-algorithms
2. https://onlinecourses.swayam2.ac.in/cec21_cs02/preview

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

COMPUTER ORGANIZATION AND ARCHITECTURE

II B. TECH- I SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS304PC	B. Tech	3	0	0	3	40	60	100

COURSE OBJECTIVES

To learn

1. The principles of computer organization and the basic architectural concepts.
2. The basic organization, design, and programming of a simple digital computer and introduces simple register transfer language to specify various computer operations.
3. Computer arithmetic, instruction set design, microprogrammed control unit, pipelining and vector processing, memory organization and I/O systems, and multiprocessors

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1. Understand the basics of instructions sets and their impact on processor design.
2. Demonstrate an understanding of the design of the functional units of a digital computer system.
3. Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
4. Design a pipeline for consistent execution of instructions with minimum hazards.
5. Recognize and manipulate representations of numbers stored in digital computers

UNIT-I	BASIC OPERATIONS	Classes: 14

Digital Computers: Introduction, Block diagram of Digital Computer, Definition of ComputerOrganization, 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	CPU & MICRO PROGRAMMED CONTROL	Classes: 13

Microprogrammed Control: Control memory, Address sequencing, micro program example, designof control unit.
Central Processing Unit: General Register Organization, Instruction Formats, Addressing modes,Data Transfer and Manipulation, Program Control.

UNIT-III	DATA REPRESENTATION AND COMPUTER ARTIHMETIC	Classes: 12

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 AND MEMORY ORGANIZATION	Classes: 11

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	PIPELINE PROCESSING AND MULTI PROCESSORS	Classes: 11

Reduced Instruction Set Computer: CISC Characteristics, RISC Characteristics.
Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, InstructionPipeline, RISC Pipeline, Vector Processing, Array Processor.
Multi Processors: Characteristics of Multiprocessors, Interconnection Structures, Interprocess or arbitration, Interprocessor communication and synchronization, Cache Coherence.

TEXT BOOKS

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

REFERENCE BOOKS

1. Dr.P.Santhosh Kumar Patra andMrs. Manu Hajari, ‘ Computer Organization and Architecture’, SunRaise International Publishers, First Edition, 2021. ISBN: 978-93-92311-00-0
2. Computer Organization – Car Hamacher, ZvonksVranesic, SafeaZaky, Vth Edition, McGraw Hill.
3. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.
4. Structured Computer Organization – Andrew S. Tanenbaum,4thEdition, PHI/Pearson.

WEB REFERENCES

1. "Computer Organization and Design:TheHardware/SoftwareInterface""byDavid A Patterson and John LHennessy
2. "Computer Organization "by Zvonco Vranesic and Safwat Zaky"
3. Computer Architectureand Organization"byJohn P Hayes.

E -TEXT BOOKS

1. Fundamentals of Computer organization and Design by Shivarama Dandamudi
2. Computer Architecture: Complexity and Correctness by Mueller andPaul

MOOCS COURSES

1. https://www.mooc-list.com › tags›computer-architecture
2. https://www.edx.org › course›computation-structures-3-computer-mitx-6

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

SOFTWARE ENGINEERING

II B. TECH- I SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS306PC	B. Tech	3	0	0	3	40	60	100

COURSE OBJECTIVES

To learn

1. 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.
2. Topics include process models, software requirements, software design, software testing, software process/product metrics, risk management, quality management and UML diagrams

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

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).
2. Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
3. Will have experience and/or awareness of testing problems and will be able to develop a simple testing report

UNIT-I	INTRODUCTION TO SOFTWARE ENGINEERING	Classes: 13

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	Classes: 12

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	Classes: 12

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	Classes: 12

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	Classes: 12

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. Dr.P.Santhosh Kumar Patra, Mrs. P. Devasudha, Dr.P.Sai Prasad and Mrs. T. Bhargavi, 'Software Engineering', Spectrum University Press, First Edition, 2022. ISBN: 978-93-92184-02-4
2. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, McGraw Hill International Edition.
3. 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, WitoldPedrycz, 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.

WEB REFERENCES

1. https://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.tutorialspoint.com%2Fsoftware_engineering%2Fsoftware_engineering_tutorial.pdf&clen=3241146&chunk=true
2. https://www.geektonight.com/software-engineering-notes/

E -TEXT BOOKS

1. https://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fengineering.futureuniversity.com%2FBOOKS%2520FOR%2520IT%2FSoftware-Engineering-9th-

Edition-by-Ian-Sommerville.pdf&clen=5397464&chunk=true

2. https//efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.mlsu.ac.in%2Fecontents%2F16_EBOOK7th_ed_software_engineering_a_practitioners_approach_by_roger_s._pressman_.pdf&clen=21023620&chunk=true

MOOCS COURSES

1. https://www.geeksforgeeks.org/software-engineering
2. https://nptel.ac.in/courses/106105087/pdf/m01L01.pdf
3. https://onlinecourses.nptel.ac.in/noc21_cs13/preview.
4. https://www.tutorialspoint.com/software_engineering/index.htm
5. https://www.javatpoint.com/software-engineering-tutorial

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

OPERATING SYSTEMS

II B. TECH- I SEMESTER (R22)

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS305PC	B. Tech	3	0	0	3	40	60	100

COURSE OBJECTIVES

To learn

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

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1. Will be able to control access to a computer and the files that may be shared
2. Demonstrate the knowledge of the components of computers and their respective roles in computing.
3. Ability to recognize and resolve user problems with standard operating environments.
4. Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.

UNIT-I	OPERATING SYSTEM - INTRODUCTION	Classes: 10

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	Classes:8

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, DeadlockPrevention,DeadlockAvoidance,DeadlockDetection,and RecoveryfromDeadlock

UNIT-III	PROCESS MANAGEMENT AND SYNCHRONIZATION	Classes: 10

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	Classes: 8

Memory Management and Virtual Memory - Logical versus Physical Address Space, Swapping,Contiguous Allocation, Paging, Segmentation, Segmentation with Paging, Demand Paging, PageReplacement,Page ReplacementAlgorithms.

UNIT-V	FILE SYSTEM INTERFACE AND OPERATIONS	Classes: 8

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.

TEXT BOOKS

1. Dr.P.Santhosh Kumar Patra, Mr.A.Mruthyunjayam, Dr.M. Narayanan, Dr.T.Poongothai, and Mrs. E. Soumya, ‘ Operating Systems’, Spectrum University Press, First Edition, 2022. ISBN: 978-93-93199-02-7
2. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
3. Advanced programming in the UNIX environment, W.R. Stevens, Pearson education.
4. Geethika Ghosh, Piyali Gosh, Purba Roy Choudhury, Managerial Economics, 2e, Tata McGraw Hill Education Pvt. Ltd. 2012.

REFERENCE BOOKS

1. Operating Systems-Internals and Design Principles, William Stallings, Fifth Edition–2005,PearsonEducation/PHI
2. Operating System A Design Approach-Crowley, TMH.
3. Modern Operating Systems, AndrewS.Tanenbaum2ndedition,Pearson/PHI
4. UNIX programming environment, Kernighanand Pike, PHI/Pearson Education
5. UNIX Internals-The New Frontiers, U. Vahalia, Pearson Education.

WEB REFERENCES

1. Operating System Principles by Silberschatz, Galvin, Gagne
2. Operating Systems: Internals and Design Principles, 7ebyStallings

E -TEXT BOOKS

1. http://www.freebookcentre.net/ComputerScience-Books-Download/Operating-Systems-and-Middleware-Supporting-Controlled-Interaction.html
2. http://www.freebookcentre.net/ComputerScience-Books-Download/Operating-System-by-Gopi-Sanghani.html

MOOCS COURSE

1. https://www.mooc-list.com/tags/os
2. https://nptel.ac.in/courses/106106144/2

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

INTRODUCTION TO DATA STRUCTURES LAB

II B. TECH- I SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS313PC	B. Tech	0	0	2	1	40	60	100

COURSE OBJECTIVES

To learn

1. It introduces searching and sorting algorithms
2. It provides an understanding of data structures such as stacks and queues.

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1. Able to identify the appropriate data structures and algorithms for solving real Worldproblems.
2. Able to implement various kinds of searching and sortingtechniques.
3. Able to implement data structures such as stacks, queues, Search trees, and hash tables to solve various computingproblems.

LIST OF EXPERIMENTS

1. Write a program that uses functions to perform thefollowing operations on singly linked list.
   a) Creation.
   b) Insertion
   c) Deletion.
   d) Traversal
2. Write a program that uses functions to perform thefollowing operations on doubly linked list.
   a) Creation.
   b) Insertion
   c) Deletion.
   d) Traversal

3. Write a program that uses functions to perform thefollowing operations on circular linked list.
    a) Creation.
    b) Insertion
    c) Deletion.
    d) Traversal
4. Write a program that implement stack (its operations) using
    a) Arrays b) Pointers
5. Write a program that implement Queue (its operations) using
    a) Arrays b) Pointers
6. Write a program that implements the following sorting methods to sort a given list of integers in ascending order

    A) Quick sort b) Heap sort c) Merge sort
7. Write a program to implement the tree traversal methods(Recursive and Non Recursive).
8. Write a program to implement
    a) Binary Search tree b) B Trees c) B+ Trees d)AVL trees d) 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. Dr.P.Santhosh Kumar Patra, Dr.R.Nagaraju, Mr. C. Yosepu, Mr.A.Mruthyunjayam and Mr. P.Ganesh Kumar, ‘ Data Structures using C’, S International Publishers, First Edition, 2021. ISBN: 978-81-952679-6-5.
2. Fundamentals of Data Structures in C, 2nd Edition, E. Horowitz, S. Sahni and Susan Anderson Freed, Universities Press.
3. Data Structures using C – A. S. Tanenbaum, Y. Langsam, and M. J. Augenstein, PHI/Pearson Education.

REFERENCE BOOKS

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

WEB REFERENCES

1. “Python Data Structures and Algorithms” byBenjamin Baka.

E -TEXT BOOKS

1. Data Structures in C Nair, Achuthsankar S.Mahalakshmi,T.

MOOCS COURSES

1. https://nptel.ac.in/courses/106/106/106106127/
2. https://nptel.ac.in/courses/106/106/106106145/

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

OPERATING SYSTEMS LAB

II B. TECH- I SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS311PC	B. Tech	0	0	2	1	40	60	100

COURSE OBJECTIVES

To learn

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

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

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

LIST OF EXPERIMENTS

1. Write C programs to simulate the following CPU Scheduling algorithms a) FCFS b) SJF c) Round Robin d) priority
2. Write programs using the I/O system calls of UNIX/LINUX 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 Queuesd) 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. Dr.P.Santhosh Kumar Patra, Mr.A.Mruthyunjayam, Dr.M. Narayanan, Dr.T.Poongothai, and Mrs. E. Soumya, ' Operating Systems', Spectrum University Press, First Edition, 2022. ISBN: 978-93-93199-02-7
2. Operating Systems – Internals and Design Principles, William Stallings, Fifth Edition– 2005, Pearson Education/PHI
3. Operating System - A Design Approach-Crowley, TMH.
4. Modern Operating Systems, Andrew S Tanenbaum, 2nd edition, Pearson/PHI
5. UNIX Programming Environment, Kernighan and Pike, PHI/Pearson Education
6. UNIX Internals: The New Frontiers, U. Vahalia, Pearson Education

WEB REFERENCES

1. "Test Frame: An Approach to Structured Testing" by Chris C. Schotanus
2. "Logistic Core Operations with SAP: InventoryManagement, Warehousing, Transportation, and Compliance" by Jens Kappauf and BerndLauterbach
3. "Supply Chain Management Based on SAP Systems: Order Management inManufacturing Companies (SAP Excellence)" by Gerhard F Knolmayer andPeterMertens

E -TEXT BOOKS

1. Operating System: From 0 to 1 by Tu, Do Hoang - Github,2017
2. Operating Systems Tata Mc Graw-Hill E
3. Introducing Windows 8: An Overview for IT Professionals by Jerry Honeycutt - Microsoft Press , 2012education,1997
4. Microsoft Windows Server System Deployment Guide for Midsize Businesses - Microsoft Press,2005

MOOCS COURSES

1. https://www.classcentral.com › tag›operating-systems
2. https://www.my-mooc.com ›mooc› introduction-to-operating-systems--u.
3. https://www.computersciencezone.org›computer-science-education-free-.
4. https://www.classcentral.com › tag›operating-systems.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

SOFTWARE ENGINEERING LAB

II B. TECH- I SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CSM308PC	B. Tech	0	0	2	1	40	60	100

COURSE OBJECTIVES

To learn

1. 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

Upon successful completion of the course, the student is able to

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

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

4. Dr.P.Santhosh Kumar Patra, Mrs. P. Devasudha, Dr.P.Sai Prasad and Mrs. T. Bhargavi, 'Software Engineering', Spectrum University Press, First Edition, 2022. ISBN: 978-93-92184-02-4
5. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, McGraw Hill International Edition.
6. Software Engineering- Sommerville, 7th edition, Pearson Education.
7. 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, WitoldPedrycz, John Wiley.
2. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill

WEB REFERENCES

1. https://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.lnjpitchapra.in%2Fwp-content%2Fuploads%2F2020%2F04%2Ffile_5e96ddefac5f3.pdf&clen=1732938&chunk=true

E -TEXT BOOKS

1. https://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=http%3A%2F%2Fseu1.org%2Ffiles%2Flevel4%2FIT-242%2FSE%2520Book.pdf&clen=4862906&chunk=true
2. https://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=http%3A%2F%2Fengineering.futureuniversity.com%2FEBOOKS%2520FOR%2520IT%2FSoftware-Engineering-9th-
3. Edition-by-Ian-Sommerville.pdf&clen=5397464&chunk=true

MOOCS COURSES

1. https://www.udemy.com/course/formal-languages-and-automata-theory/
2. https://www.geeksforgeeks.org/software-engineering
3. https://nptel.ac.in/courses/106105087/pdf/m01L01.pdf
4. https://onlinecourses.nptel.ac.in/noc21_cs13/preview.
5. https://www.tutorialspoint.com/software_engineering/index.htm
6. https://www.javatpoint.com/software-engineering-tutorial

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

CONSTITUTION OF INDIA

II B. TECH I SEMESTER (R20)								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIE**	**SEE**	**Total**
CI309MC	**B.Tech**	3	0	0	0	100		100

COURSE OBJECTIVES

Students will be able to:

1. Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
2. 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.
3. To address the role of socialism in India after the commencement of the Bolshevik
4. Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1. Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
2. Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
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
4. Discuss the passage of the Hindu Code Bill of 1956

UNIT-I	**INTRODUCTION TO INDIAN CONSTITUTION**	**Classes: 6**
History of Making of the Indian Constitution- History of Drafting Committee.		
UNIT-II	**THE AMENDMENT OF THE CONSTITUTION**	**Classes: 6**
Philosophy of the Indian Constitution- Preamble Salient Features		
UNIT-III	**UNION & STATE EXECUTIVE AND LEGISLATURE**	**Classes:8**

Contours of Constitutional Rights & Duties - Fundamental Rights

1. Right to Equality
2. Right to Freedom

3. Right against Exploitation
4. Right to Freedom of Religion
5. Cultural and Educational Rights
6. Right to Constitutional Remedies
7. Directive Principles of State Policy
8. Fundamental Duties.

UNIT-IV	MAJOR FUNCTIONARIES & EMERGENCY POWERS	Classes: 6

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-V	INDIAN JUDICIARY	Classes: 6

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: ZilaPanchayat. 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-VI	ELECTION COMMISSION	Classes: 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.

TEXT BOOKS

1. Mr.A.Sarveswara Reddy, Mr. K. Sathish and Mrs. K.Sudha, 'Constitution of India', Spectrum Publications, First Edition, 2021. ISBN: 978-93-91420-19-2
2. The Constitution of India, 1950 (Bare Act), Government Publication.
3. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
4. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
5. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

REFERENCE BOOKS

1. An Introduction to the Constitution of India by Dr.Durga Das Basu
2. An Introduction to the Constitution of India by M.V.Pylee
3. Indian Constitutional Law by M.P. Jain

WEB REFERENCES

1. https://www.wdl.org/en/item/2672/
2. https://nptel.ac.in/courses/109103135/24

E -TEXT BOOKS

1. https://iasexamportal.com/ebook/the-constitution-of-india
2. https://www.india.gov.in/my-government/documents/e-books

MOOCS COURSES

1. http://nludelhi.ac.in/images/moocs/moocs-courses.pdf

2. https://www.classcentral.com/tag/constitutional-law

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

NODE JS/ REACT JS/ DJANGO

II B. TECH- I SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS312PC	B. Tech	0	0	2	1	40	60	100

COURSE OBJECTIVES

To learn

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

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

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

LIST OF EXPERIMENTS

1. Build a responsive web application for shopping cart with registration, login, catalog and cartpagesusing CSS3features,flexand grid.
2. Make the above web application responsive web application using Bootstrap framework.
3. Use Java Script 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. Implementan application for reading the weather information from openweathermap.org and display theinformationintheformofa graph on the web page.
5. Develop a java stand alone application that connects with the database (Oracle / mySql) andperform the CRUD operation onthedatabase tables.
6. Create an xml for the bookstore.Validatethe 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 andthe display the current and historical weather information using graphical representation usingchart.js
14. Create a TODO application in react with necessary components and deploy it into github.

TEXT BOOKS

1. Jon Duckett, Beginning HTML, XHTML, CSS, and Java Script, 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,APress.

WEB REFERENCES

1. https://elementor.com/blog/best-web-development-books/
2. https://www.geeksforgeeks.org/top-7-best-books-to-learn-react-js/

E -TEXT BOOKS

1. https://www.doc-developpement-durable.org/file/Projets-informatiques/cours-&-manuelsinformatiques/htm-html-xmlccs/Sams%20Teach%20Yourself%20HTML,%20CSS,%20and%20JavaScript%20All%20in% 20One.pdf
2. http://projanco.com/Library/Web%20Programming%20with%20HTML5,%20CSS,%20and%20JavaScript.pdf

MOOCS COURSES

1. https://www.udemy.com/course/react-js-and-python-django-full-stack-master-course/
2. https://in.coursera.org/specializations/full-stack-react

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

DISCRETE MATHEMATICS

II B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS401PC	B. Tech	3	0	0	3	40	60	100

COURSE OBJECTIVES

To learn

1. The elementary discrete mathematics for computer science and engineering.
2. Topics include formal logic notation, methods of proof, induction, sets, relations, graph theory, permutations and combinations, counting principles; recurrence relations and generating functions.

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1. Understand and construct precise mathematical proofs
2. Apply logic and set theory to formulate precise statements
3. Analyze and solve counting problems on finite and discrete structures
4. Describe and manipulate sequences
5. Apply graph theory in solving computing problems

UNIT-I	MATHEMATICAL LOGIC	Classes: 11

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	Classes: 11

Introduction, Basic Concepts of Set Theory, Representation of Discrete Structures, Relations and Ordering, Functions.

UNIT-III	ALGEBRAIC STRUCTURES	Classes: 12

Introduction, Algebraic Systems, Semi groups and Monoids, Lattices as Partially Ordered Sets, Boolean Algebra.

UNIT-IV	ELEMENTARY COMBINATORICS	Classes: 11

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	Classes: 11

Basic Concepts, Isomorphism and Subgraphs, Trees and their Properties, Spanning Trees, 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
3. Discrete Mathematics- Richard Johnsonbaugh, 7Th Edn., Pearson Education.
4. Discrete Mathematics with Graph Theory- Edgar G. Goodaire, Michael M. Parmenter.
5. Discrete and Combinatorial Mathematics - an applied introduction: Ralph.P. Grimald, 5th edition, Pearson Education.

WEB REFERENCES

1. https://math.dartmouth.edu/archive/m19f03/public_html/
2. https://nptel.ac.in/courses/106/106/106106094/

E -TEXT BOOKS

1. Discrete Mathematics, An Open Introduction, Oscar Levin.

MOOCS COURSES

1. https://www.edx.org/learn/discrete-mathematics
2. https://www.udemy.com/course/discrete-math/

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

AUTOMATA THEORY AND COMPILER DESIGN

II B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CSM404PC	B. Tech	3	0	0	3	40	60	100

COURSE OBJECTIVES

To learn

1. To introduce the fundamental concepts of formal languages, grammars and automata theory.
2. To understand deterministic and non-deterministic machines and the differences between decidability and undecidability.
3. Introduce the major concepts of language translation and compiler design and impart the knowledge of practical skills necessary for constructing a compiler.
4. Topics include phases of compiler, parsing, syntax directed translation, type checking use of symbol tables, intermediate code generation

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1. Able to employ finite state machines for modeling and solving computing problems.
2. Able to design context free grammars for formal languages.
3. Able to distinguish between decidability and undecidability.
4. Demonstrate the knowledge of patterns, tokens & regular expressions for lexical analysis.
5. Acquire skills in using lex tool and design LR parsers

UNIT-I	FINITE AUTOMATA	Classes: 15

Introduction to Finite Automata: Structural Representations, Automata and Complexity, the Central Concepts of Automata Theory – Alphabets, Strings, Languages, Problems.

Deterministic Finite Automata: Definition of DFA, How ADFA Process Strings, The language of DFA, Conversion of NFA with €-transitions to NFA without €-

transitions. Conversion of NFA to DFA, Moore and Melay machines.

Nondeterministic Finite Automata: Formal Definition, an application, Text Search, Finite Automata with Epsilon-Transitions.

UNIT-II	REGULAR EXPRESSIONS AND REGULAR LANGUAGES	Classes: 11

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.

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

UNIT-III	CONTEXT FREE GRAMMAR AND AUTOMATA	Classes: 10

Push Down Automata: Definition of the Pushdown Automaton, the Languages of a PDA, Equivalence of PDA and CFG's, Acceptance by final state

Turing Machines: Introduction to Turing Machine, Formal Description, Instantaneous description, The language of a Turing machine

Undecidability: Undecidability, A Language that is Not Recursively Enumerable, An Undecidable Problem That is RE, Undecidable Problems about Turing Machines

UNIT-IV	PROPERTIES OF CFG AND TURING MACHINES	Classes: 11

Introduction: The structure of a compiler,

Lexical Analysis: The Role of the Lexical Analyzer, Input Buffering, Recognition of Tokens, The Lexical- Analyzer Generator Lex,

Syntax Analysis: Introduction, Context-Free Grammars, Writing a Grammar, Top-Down Parsing, Bottom- Up Parsing, Introduction to LR Parsing: Simple LR, More Powerful LR Parsers

UNIT-V	UNDECIDABILITY	Classes: 11

Syntax-Directed Translation: Syntax-Directed Definitions, Evaluation Orders for SDD's, Syntax- Directed Translation Schemes, Implementing L-Attributed SDD's.

Intermediate-Code Generation: Variants of Syntax Trees, Three-Address Code

Run-Time Environments: Stack Allocation of Space, Access to Nonlocal Data on the Stack, Heap Management

TEXT BOOKS

1. Dr. P. Santhosh Kumar Patra, Mrs. P. Devasudha, Dr. R. Nagarajuand Mr. D. Babu Rao, 'Formal Languages and Automata Theory', Spectrum Publishing House, First Edition, 2022. ISBN: 978-93-93196-00-2
2. Introduction to Automata Theory, Languages, and Computation, 3nd Edition, John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, Pearson Education.
3. Theory of Computer Science – Automata languages and computation, Mishra and Chandrashekaran, 2nd Edition, PHI.

REFERENCE BOOKS

1. Compilers: Principles, Techniques and Tools, Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffry D. Ullman, 2nd Edition, Pearson.
2. Introduction to Formal languages Automata Theory and Computation, Kamala Krithivasan, Rama R, Pearson.
3. Introduction to Languages and The Theory of Computation, John C Martin, TMH.
4. lex & yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly Compiler Construction, Kenneth C. Louden, Thomson. Course Technology.

WEB REFERENCES

1. https://www.ics.uci.edu/~goodrich/teach/cs162/notes/
2. http://www.cse.iitd.ac.in/~sak/courses/toc/2011-12.index.html
3. https://web.cs.hacettepe.edu.tr/~ilyas/Courses/BBM401/

E -TEXT BOOKS

1. https://www.cis.upenn.edu/~cis262/notes/tcbook-u.pdf
2. http://people.math.sc.edu/mlevet/Lecture_Notes.pdf
3. https://www.cs.utexas.edu/~ear/cs341/automatabook/AutomataTheoryBook.pdf

MOOCS COURSE

1. https://www.udemy.com/course/formal-languages-and-automata-theory/
2. https://nptel.ac.in/courses/106/106/106106049/
3. https://www.udemy.com/course/theory-of-automata/

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

DATABASE MANAGEMENT SYSTEMS

II B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS405PC	B. Tech	3	0	0	3	40	60	100

COURSE OBJECTIVES

To learn

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

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

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

UNIT-I	DATABASE SYSTEM APPLICATIONS	Classes: 11

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	Classes: 11

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

Relational Algebra, Tuple relational Calculus, Domain relational calculus.

UNIT-III	SQL AND SCHEMA REFINEMENT	Classes: 12

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 CONCEPT	Classes: 12

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

UNIT-V	KNOWLEDGE REPRESENTATION	Classes: 12

Data on External Storage, File Organization and Indexing, Cluster Indexes, Primary and Secondary Indexes, Index data Structures, Hash Based Indexing, Tree based Indexing, Comparison of File Organizations, Indexes- Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM),
B+ Trees: A Dynamic Index Structure.

TEXT BOOKS

1. Dr.P.Santhosh Kumar Patra, Dr. N. Satheesh and Dr.R.Nagaraju,'Database Management Systems',Spectrum Techno Press, First Edition, 2022. ISBN: 978-93-83470-49-5
2. Database System Concepts, Silberschatz, Korth, McGraw hill, V edition.3rd Edition
3. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata McGraw Hill

REFERENCE BOOKS

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, ElmasriNavrate, 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.

WEB REFERENCES

1. http://www.freebookcentre.net/Database/Free-Database-Systems-Books-Download.html
2. https://www.gatevidyalay.com/transaction-states-in-dbms/

E -TEXT BOOKS
1. 1. http://www.ebooks-for-all.com/bookmarks/detail/Database-Management-Systems/onecat/0.html 2. http://freecomputerbooks.com/dbSystemsBooks.html
MOOCS COURSES
1. https://swayam.gov.in/nd2_cec19_cs05/preview 2. https://swayam.gov.in/nd2_nou19_lb03/preview

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

INTRODUCTION TO ARTIFICIAL INTELLIGENCE

II B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CSM406PC	B. Tech	3	0	0	3	40	60	100

COURSE OBJECTIVES

To learn

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

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

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.
2. Apply AI techniques to solve problems of game playing, theorem proving, and machine learning.
3. Learn different knowledge representation techniques.
4. Understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
5. Comprehend the applications of Probabilistic Reasoning and Bayesian Networks.
6. Analyze Supervised Learning Vs. Learning Decision Trees

UNIT-I	INTRODUCTION TO AI	Classes: 12

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	Classes: 14
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**	**Classes: 11**
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**	**Classes: 12**
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**	**Classes: 13**
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, Relational and First- Order Probability.		

TEXT BOOKS

1. Dr. P. Santhosh Kumar Patra, Dr. T. Poongothai, Dr. G. GovindaRajulu, Mr. P. Deepan and Dr. N. Satheesh, ' Introduction to Artificial Intelligence', Amaravathi Publishers, First Edition, 2022. ISBN: 978-93-93199-12-6
2. 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, ShivaniGoel, Pearson Education.
4. Artificial Intelligence and Expert systems – Patterson, Pearson Education.
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WEB REFERENCES

1. https://eecs.wsu.edu/~cook/ai/lectures/p.html
2. http://www.cs.toronto.edu/~fbacchus/csc384/Lectures/lectures.html
3. http://web.cs.iastate.edu/~cs572/studyguide.html
4. https://faculty.ist.psu.edu/vhonavar/Courses/ai/studyguide.html

E -TEXT BOOKS

1. George F. Luger, Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Pearson Education, 6th ed., 2009.

MOOCS COURSES

1. https://www.udacity.com/course/intro-to-artificial-intelligence--cs271
2. https://www.classcentral.com/course/edx-artificial-intelligence-ai-7230
3. https://www.my-mooc.com/en/mooc/intro-to-artificial-intelligence/

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

II B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS413PC	B. Tech	3	0	0	3	40	60	100

COURSE OBJECTIVES

To learn

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

COURSE OUTCOMES

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

UNIT-I	OBJECT-ORIENTED THINKING AND INHERITANCE	Classes: 13

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, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, method binding, inheritance, overriding and exceptions, parameter passing, recursion, nested and inner classes, exploring string class.

UNIT-II	INHERITANCE, PACKAGES AND INTERFACES	Classes: 12

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. Member access rules, super uses, using final with inheritance, polymorphism-method overriding, abstract classes, the Object class. Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces. Exploring java.io.

UNIT-III	EXCEPTION HANDLING AND MULTITHREADING	Classes: 12

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	Classes: 12

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	GUI PROGRAMMING WITH SWING	Classes: 13

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. Dr.P.Santhosh Kumar Patra, Mr.J.Sudhakar, Mr. M. Manohar, and Mr. A. VeeraBabu,'Spectrum Complete Reference: Java Programming with OOPs Concepts', Surneni International Book Publishers, First Edition, 2022. ISBN: 978-81-953920-6-3
2. Java the complete reference, 7th edition, Herbert schildt, TMH.
3. 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.

WEB REFERENCES

1. http://www.developer.com/icom_includes/feeds/developer/dev-25.xml
2. http://www.ibm.com/developerworks/views/java/rss/libraryview.jsp
3. http://www.javaworld.com/rss/index.html
4. http://feeds.feedburner.com/DevxLatestJavaArticles

E -TEXT BOOKS

1. HTTP Programming Recipes for Java Bots by Jeff Heaton - Heaton Research, Inc.
2. Java Distributed Computing by Jim Farley -O'Reilly Media
3. Java Precisely by Peter Sestoft - IT Universityof Copenhagen
4. Java for Absolute Beginners: Learn to Program the Fundamentals the Java9+ Way
5. Fundamentals of the Java Programming Language, JavaSE6
6. JAVA: Easy Java Programming for Beginners, Your Step-By-StepGuideto

MOOCS COURSES

1. https://www.mooc-list.com › tags›java-programming
2. https://www.mooc-list.com › tags›java
3. https://www.edx.org › learn›java
4. https://www.udacity.com › course›java-programming-basics--ud282
5. https://www.futurelearn.com › courses›begin-programming.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

DATABASE MANAGEMENT SYSTEMS LAB

II B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CS407PC	B. Tech	0	0	2	1	40	60	100

COURSE OBJECTIVES

To learn

1. Introduce ER data model, database design and normalization
2. Learn SQL basics for data definition and data manipulation

COURSE OUTCOMES

1. Design database schema for a given application and apply normalization
2. Acquire skills in using SQL commands for data definition and data manipulation.
3. Develop solutions for database applications using procedures, cursors and trigger.

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. Dr.P.Santhosh Kumar Patra, Dr. N. Satheesh and Dr.R.Nagaraju,'Database Management Systems',Spectrum Techno Press, First Edition, 2022. ISBN: 978-93-83470-49-5
2. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata McGraw Hill, 3rd Edition
3. 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, ElmasriNavrate, 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.

WEB REFERENCES

1. https://www.edx.org/learn/databases
2. https://www.youtube.com/playlist?list=PLyvBGMFYV3auVdxQ1-88ivNFpmUEy-U3M
   https://www.youtube.com/watch?v=bGyHqvQW6JY&list=PLRFPL_aa_SLVjQn93cUGZaKZVGr_80vYv&index=1

E -TEXT BOOKS

1. Fundamentals of Database Management Systems, M. L. Gillenson, Wiley Student Edition.

MOOCS COURSES

1. https://onlinecourses.nptel.ac.in/noc21_cs04/preview
2. https://www.coursera.org/learn/database-management
3. https://www.udemy.com/course/database-management-system-from-scratch-part-1/

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

JAVA PROGRAMMING LAB

II B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
IT408PC	B. Tech	0	0	2	1	40	60	100

COURSE OBJECTIVES

To learn

1. To understand OOP principles.
2. To understand the Exception Handling mechanism.
3. To understand Java collection framework.
4. To understand multithreaded programming.
5. To understand swing controls in Java.

COURSE OUTCOMES

1. Able to write the programs for solving real world problems using Java OOP principles.
2. Able to write programs using Exceptional Handling approach.
3. Able to write multithreaded applications.
4. Able to write GUI programs using swing controls in Java.

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]

TEXT BOOKS

1. Dr.P.Santhosh Kumar Patra, Mr.J.Sudhakar, Mr. M. Manohar, and Mr. A. VeeraBabu,'Spectrum Complete Reference: Java Programming with OOPs Concepts', Surneni International Book Publishers, First Edition, 2022. ISBN: 978-81-953920-6-3

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.

WEB REFERENCES

1. Head First Java: A Brain-Friendly Guide 2nd Edition, Kindle Edition byKathy Sierra.
2. Effective Java: A Programming Language Guide (Java Series) 2nd Edition, Kindle Edition byJoshua Bloch.
3. AI Algorithms, Data Structures, and Idioms in Prolog, Lisp, and Java Paperback – Import, 25 Aug 2008 by George F. Luger (Author), William AStubblefield(Author).

E -TEXT BOOKS

1. Introduction to Java Programming and Data Structures, Comprehensive Version (11th Edition) 11th Edition by Y.DanielLiang.
2. Java How to Program, Early Objects (11th Edition) (Deitel: How to Program) 11th Edition by Paul J. Deitel(Author), HarveyDeitel(Author).

MOOCS COURSES

1. https://www.mooc-list.com › tags›java-programming
2. https://www.mooc-list.com › tags›java
3. https://www.edx.org › learn›java
4. https://www.quora.com ›What-are-the-best-MOOCs-for-learning-Java

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)
GENDER SENSITIZATION LAB

II B. TECH- I SEMESTER (R20)

Course Code	Category	Hours /Week			Credits	MaximumMarks		
		L	T	P	C	CIE	SEE	Total
GS409MC	B.Tech	0	0	2	0	100	-	100

COURSEOBJECTIVES:

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

COURSEOUTCOMES:

1. Students will have developed a better understanding of important issues related to gender in contemporary India.
2. 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.
3. Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
4. Students will acquire insight into the gendered division of labor and its relation to politics and economics.
5. Men and women students and professionals will be better equipped to work and live together as equals.
6. 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

UNIT-I	UNDERSTANDING GENDER	Classes:8

Introduction: Definition of Gender-Basic Gender Concepts and Terminology-Exploring AttitudestowardsGender-Construction ofGender-Socialization:MakingWomen,MakingMen - PreparingforWomanhood.GrowingupMale.FirstlessonsinCaste.

UNIT-II	GENDER ROLE AND RELATIONS	Classes:8
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**	**Classes:8**
Division and Valuation of Labour-Housework: The Invisible Labor- "My Mother doesn't Work." "Share the 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**	**Classes:8**
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 Out: Is 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**	**Classes:8**
Gender and Film-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature- Gender Development Issues-Gender Issues -Gender Sensitive Language-Gender and Popular 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		

TEXT BOOKS:

1. A. Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu, The Textbook, "Towards a World of Equals: A Bilingual Textbook on Gender" written by published by Telugu Akademi, Telangana Government (2015).
2. Raj Pal Singh, Anupama Sihag, "Gender Sensitization: A World of Equals", Raj Publications (Dist.), ISBN: 9789386695123, 938669512X (2019)

REFERENCE BOOKS:

1. S .Benhabib. Situating the Self: Gender, Community, Gender and Post modernism in Contemporary Ethics, London; Routledge, 1992.

WEB REFERENCES:

1. https://www.researchgate.net/publication/329541569_EMPOWERING_WOMEN_THROUGH_GENDER_SENSITIZATION
2. https://eige.europa.eu/gender-mainstreaming/toolkits/gender-sensitive-parliaments/references-and-resources

E –TEXTBOOKS:

1. https://harpercollins.co.in/BookDetail.asp?BookCode=3732
2. https://unesdoc.unesco.org/ark:/48223/pf0000158897_eng

MOOCS COURSE:

1. https://www.mooc-list.com/course/sustainable-development-goal-5-gender-equality-canopylab
2. https://www.coursera.org/learn/gender-sexuality

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)
SKILL DEVELOPMENT COURSE (PROLOG/ LISP/ PYSWIP)

II B. TECH- II SEMESTER (R22)

Course Code	Programme	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
CSM411PC	B. Tech	0	0	2	1	40	60	100

COURSE OBJECTIVES

To learn

1. ER data model, database design and normalization
2. SQL basics for data definition and data manipulation

COURSE OUTCOMES

Upon successful completion of the course, the student is able to

1. Design database schema for a given application and apply normalization
2. Acquire skills in using SQL commands for data definition and data manipulation.
3. Develop solutions for database applications using procedures, cursors and triggers

LIST OF EXPERIMENTS

1. Write simplefactforfollowing:
   A. Ramlikesmango.
   B. Seema is a girl.
   C. Billlikes Cindy.
   D. Roseisred.
   E. Johnownsgold
2. Write predicates one converts centigrade temperatures to Fahrenheit, the other checks if atemperatureisbelowfreezing.
3. Write a program to solve the Monkey Banana problem
4. WAP in turbo prolog for medical diagnosis and show the advantages and disadvantages ofgreenand red cuts.
5. Write a program to solvethe4-Queenproblem.
6. Write a program to solve traveling salesman problems.
7. Write a program to solve waterjug problems using Prolog.
8. WritesimplePrologfunctionssuchasthefollowing.Takeintoaccountlistswhichareto oshort.
   --removethe Nthitemfromthe list.--insertasthe Nthitem.
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 New Tree is the Tree produced by adding the item Xinaleafnode.Tree and New Tree 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 A list 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(A List, B list, Count) that is true if A list occurs Count times within B list. Define without using an accumulator. Use "not" as defined in utilities.pro, to make similarcasesare unique,orelse youmaygetmorethan one countasan answer.

    Examples:
    mem
    Count
    (a,[b,
    a],N).
    N =1;
    nomemCount(a,
    [b,[a,a,[a],c],a],
    N).N =4;
    nomemCount([a]
    ,[b,[a,a,[a],c],a],
    N).N =1;
    No

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

WEB REFERENCES

1. https://pypi.org/project/pyswip/0.2.2/
2. https://github.com/yuce/pyswip
3. https://swi-prolog.discourse.group/t/useful-prolog-references/1089

E -TEXT BOOKS

1. http://www.dbnet.ece.ntua.gr/~adamo/csbooksonline/prolog-notes.pdf
2. https://drive.uqu.edu.sa/_/fbshareef/files/textbook.pdf

MOOCS COURSES

1. https://www.mooc-list.com/course/prolog-beginners-coursera
2. https://www.classcentral.com/subject/lisp