ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

AU24 REGULATIONS COURSE STRUCTURE

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Semester I (First Year)

Sl. No.	Category	Course Code	Course Title	Hours per Week			Credits
				L	T	P	C
1	HSM	24AENG11T	English for Engineers	3	0	0	3
2	BS	24APHY11T	Applied Physics	3	0	0	3
3	BS	24AMAT11T	Matrix Theory and Calculus	3	0	0	3
4	ES	24ACSE11T	Computational Problem Solving	3	0	0	3
5	ES	24AMEC12L	Engineering & IT Workshop	1	0	4	3
6	HSM	24AENG11L	English Language Communication Skills Lab	0	0	2	1
7	BS	24APHY11L	Applied Physics Lab	0	0	2	1
8	ES	24ACSE11L	Computational Problem-Solving Lab	0	0	2	1
9	HSM	24ALAN11T	Language Elective	1	0	0	1
						Total Credits	**19**

Semester II (First Year)

Sl. No.	Category	Course Code	Course Title	Hours per Week			Credits
				L	T	P	C
1	BS	24ACHE21T	Chemistry	3	0	0	3
2	BS	24AMAT21T	Differential Equations and Transform Techniques	3	0	0	3
3	BS	24AEEE21T	Basic Electrical and Electronics Engineering	3	0	0	3
4	ES	24ACSE21T	Data Structures	3	0	3	3
5	ES	24ACSE22T	The Joy of Computing using Python	3	0	0	3
6	ES	24AMEC21T	Engineering Drawing	1	0	4	3
7	BS	24ACHE21L	Chemistry Lab	0	0	2	1
8	BS	24AEEE21L	Basic Electrical and Electronics Engineering Lab	0	0	2	1
9	ES	24ACSE21L	Data Structures Lab	0	0	2	1
						Total Credits	**21**

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RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	**English for Engineers**	
Category:	Humanities	
Semester:	I Semester	II Semester
Course Code:	24ACHE12T	24AENG21T
Branch/es:	CSE, CSE-DS, CSE(AIML), AIML	AI&DS, CE, CSE (AI), CSE(ICB), ECE, EEE, ME

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives: The course aims to enhance listening, reading, speaking, and writing skills of the students by improving their comprehension abilities and knowledge of grammatical structures and vocabulary. Through targeted instruction, students will develop effective speaking and writing capabilities, fostering a more comprehensive understanding of language use.

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

1. Understand the context, topic, and pieces of specific information from social or transactional details
2. Analyze literary forms, journalistic articles and scientific readings for comprehension and retention
3. Demonstrate effective writing and speaking skills
4. Apply grammatical knowledge in speaking and writing and formulate sentences with grammatical accuracy
5. Produce coherent and unified paragraphs with adequate support and detail

Unit 1
Lesson: A Proposal to Girdle the Earth
Reading: Skimming the text to get main ideas of it; scanning the text to look for specific pieces of information.
Writing: Mechanics of Writing - Capitalization, Spellings, Punctuation
Grammar: Parts of Speech, Content and Structure words, Basic Sentence Structures, Forming Questions
Vocabulary: Synonyms, Antonyms, Affixes (Prefixes/Suffixes), Root words

Unit 2
Lesson: The District School As It Was by One Who Went to It
Reading: Identifying the sequence of ideas; recognizing verbal techniques that help to link ideas in a paragraph together
Writing: Paragraph Writing: Structure of a Paragraph, Cohesive devices - linkers
Grammar: Use of Articles and Zero Article; Prepositions
Vocabulary: Homonyms, Homophones, Homographs

Unit 3
Lesson: The Future of Work
Reading: Reading a text in detail by making basic inferences -recognizing and interpreting specific context clues; strategies to use text clues for comprehension
Writing: Summarizing, Note-making, paraphrasing Grammar: Verbs - Tenses; Subject-verb Agreement
Vocabulary: Compound words, Collocations

Unit 4
Lesson: The Future of Work
Reading: Reading a text in detail by making basic inferences -recognizing and interpreting specific context clues; strategies to use text clues for comprehension
Writing: Summarizing, Note-making, paraphrasing Grammar: Verbs - Tenses; Subject-verb Agreement
Vocabulary: Compound words, Collocations

Unit 5
Lesson: Leaves from the Mental Portfolio of a Eurasian
Reading: Reading comprehension.
Writing: Writing structured essays on specific topics.
Grammar: Editing short texts –identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject verb agreement)
Vocabulary: Technical Jargon

Prescribed Textbooks:

1. Prabhavathi Y et al. English All Round: Communication Skills for Undergraduate Students – 1. Orient Black Swan, 2022

Reference Books:

1. Dubey, Sham Ji & Co. English for Engineers. Vikas Publishers, 2020
2. Bailey, Stephen. Academic **Writing:** A Handbook for International Students. Routledge, 2014.
3. Murphy, Raymond. English Grammar in Use. 4th Ed. Cambridge University Press, 2019.
4. Lewis, Norman. Word Power Made Easy- The Complete Handbook for Building a Superior Vocabulary. Anchor, 2014.

Web Resources:
GRAMMAR:
1. www.bbc.co.uk/learningenglish
2. https://dictionary.cambridge.org/grammar/british-grammar/
3. www.eslpod.com/index.html
4. https://www.learngrammar.net/
5. https://english4today.com/english-grammar-online-with-quizzes/
6. https://www.talkenglish.com/grammar/grammar.aspx

VOCABULARY
1. https://www.youtube.com/c/DailyVideoVocabulary/videos
2. https://www.youtube.com/channel/UC4cmBAit8i_NJZE8qK8sfpA

CO-PO Mapping:

Course outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of Complex Problems	Engineering tools usage	The Engineer and World	Ethics	Individual and collaborative teamwork	Communication	Project Ma engagement and Finance	Life-long Learning
24AENG11T/21T.1	-	-	-	-	-	-	1	-	3	-	1
24AENG11T/21T.2	-	-	-	-	-	-	1	-	3	-	1
24AENG11T/21T.3	-	-	-	-	-	-	1	-	3	-	1
24AENG11T/21T.4	-	-	-	-	-	-	1	-	3	-	1
24AENG11T/21T.5	-	-	-	-	-	-	1	-	3	-	1

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RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	**Applied Physics**	
Category:	BS	
Semester:	I Semester	II Semester
Course Code:	24APHY11T	24APHY21T
Branch/es:	CSE, CSE(DS), CSE(AIML) & AI&ML	EEE, ECE, CSE-AI, AI&DS & CSE(ICB)

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives: The course aims to provide a strong foundation in the basic concepts of wave optics, lasers, and fiber optics, while also introducing students to crystal structures and X-ray diffraction techniques. It further explains key principles of dielectrics, magnetic materials, semiconductors, and superconductors, highlighting their importance and applications in various engineering fields.

Course Outcomes:

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

1. Understand interference, diffraction and polarization in engineering.
2. Explain the types of crystal structures and X-ray diffraction.
3. Analyze various types of polarization of dielectrics and magnetic materials.
4. Apply laser and fiber optics principles in communication field.
5. Describe the properties and behavior of semiconductors and superconductors

Unit 1 Wave Optics 10

Interference: Introduction – Principle of superposition – Interference of light – Interference in thin films (Reflection Geometry)– Newton's Rings, determination of wavelength – Engineering applications of interference.

Diffraction: Introduction – Fresnel and Fraunhofer diffractions – Fraunhofer diffraction due to single slit, double slit & Diffraction Grating - Grating spectrum – Dispersive power of Grating– Engineering applications of diffraction.

Polarization: Introduction –Types of polarization – Double refraction – Nicol's Prism – Half wave and Quarter wave plates – Engineering applications of polarization.

Unit 2 Crystallography and X-ray diffraction 9

Crystallography: Space lattice, basis, unit cell and lattice parameters – 7 crystal systems- Bravais Lattices – coordination number – packing fraction of SC, Bcc & Fcc – Miller indices – separation between successive (hkl) planes.

X-ray diffraction: Bragg's law – X-ray Diffractometer –Laue's method and powder method.

Unit 3 Dielectric and Magnetic Materials 10

Dielectric Materials: Introduction – Dielectric polarization – Dielectric polarizability, susceptibility, dielectric constant and displacement vector – relation between the electric vectors – Types of polarizations– electronic, ionic, orientation (Qualitative) and Space charge (Qualitative) – Frequency dependence of polarization – Lorentz internal field – Clausius-Mossotti equation – Applications of dielectrics.

Magnetic Materials: Introduction – Magnetic dipole moment – Magnetization–Magnetic susceptibility and permeability –Origin of magnetic moments – Classification of magnetic materials: Dia, para, ferro, anti-ferro & ferri magnetic materials – Hysteresis – soft and hard magnetic materials – Applications of magnetic materials

Unit 4 LASERs and Fiber Optics 10

LASERs: Introduction – characteristics of lasers – spontaneous and stimulated emission of radiation – Einstein's coefficients – population inversion – pumping mechanism – He-Ne laser – semiconductor laser – Applications of lasers.

Fiber Optics: Introduction - Optical Fiber construction – Working principle (Total Internal Reflection & critical Angle) – Acceptance angle & Numerical Aperture of optical fiber – Classification of fibers based on Refractive index profile & modes (Step index and Graded index optical fibers) – optical fiber losses – Block diagram of fiber optic communication – Medical and Sensor Applications.

Unit 5 Semiconductors and Superconductors 9

Semiconductors: Formation of energy bands – classification of solids on the basis energy band theory- Intrinsic and Extrinsic semiconductors – Drift and diffusion currents – Einstein's equation–Direct and indirect band gap semiconductors- Hall Effect and its applications.

Superconductors: Properties of superconductors– Meissner's effect – Type-1 and Type-2 Superconductors – BCS Theory – Josephson effect (AC & DC) – Applications of superconductors.

Prescribed Textbooks:

1. M. N. Avadhanulu, P. G. Kshirsagar & T. V. S. Arunmurthy. A Textbook of Engineering Physics. 11th Ed., S. Chand Publications, 2019
2. K. Thyagarajan. Applied Physics. McGraw Hill Education (India) Private Ltd, 2020
3. Neeraj Mehta. Applied Physics for Engineers. PHI Learning Private Limited, 2014

Reference Books:

1. K. Palanisamy. Applied Physics. Sci. Tech, 2017
2. K. Vijaya Kumar. A Textbook of Engineering Physics. S. Chand Publications, 2018
3. Charles Kittel. Introduction to Solid State Physics. Wiley Publications, 2011

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The Engineer and world	Ethics	Individual and Collaborative teamwork	Communication	Project management and finance	Life-long learning
24APHY11T/21T.1	2	2	1	1	-	-	-	-	-	-	1
24APHY11T/21T.2	2	2	1	1	-	-	-	-	-	-	1
24APHY11T/21T.3	3	3	2	2	-	-	-	-	-	-	1
24APHY11T/21T.4	3	2	1	2	-	-	-	-	-	-	1
24APHY11T/21T.5	2	2	1	1	-	-	-	-	-	-	1

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RAJAMPET, Annamayya District, AP – 516126,

Title of the Course: **Matrix Theory and Calculus**
Category: BS
Semester: I Semester
Course Code: 24AMAT11T
Branch/es: Common to all branches

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives: This course aims to familiarize students with matrix theory and its practical applications, equipping them with essential tools for mathematical and engineering problem-solving. It also focuses on imparting knowledge of partial derivatives, mean value theorems, and multiple integrals to effectively address real-world engineering challenges. Additionally, students will develop proficiency in vector differentiation and integration to solve complex engineering problems.

Course Outcomes:
At the end of the course, the student will be able to
1. Understand the methods for solving systems of linear equations
2. Utilize matrix algebra techniques for engineering applications
3. Analyze functions of several variables to optimization techniques
4. Determine the area of solids using multiple integrals
5. Apply vector integral theorems in evaluating double and triple integrals

Unit 1 **Matrices** **10**

Rank of a matrix by echelon form, normal form, solving system of homogeneous and non-homogeneous linear equations, Cayley-Hamilton theorem (without proof), finding inverse and power of a matrix by Cayley- Hamilton theorem.

Unit 2 **Eigen values and Eigen vectors** **8**

Eigen values and Eigen vectors and their properties, diagonalization of a matrix, quadratic forms and nature of the quadratic forms, reduction of quadratic form to canonical form by orthogonal transformation.

Unit 3 **Dielectric and Magnetic Materials** **10**

Taylor's theorem and Maclaurin's theorem for one variable (without proofs) – simple problems.
Partial derivatives, total derivatives, Chain rule, change of variables, Jacobian, Maxima and Minima of functions of two variables, method of Lagrange multipliers for three variables.

Unit 4 **Multiple Integrals** **8**

Double integrals, change of order of integration, change of variables (Cartesian to polar), areas enclosed by plane curves, evaluation of triple integrals.

Unit 5 **Vector Calculus** **10**

Vector differentiation: Scalar and Vector point functions, vector operator Del, del applies to scalar point functions-Gradient, directional derivative, del applied to vector point functions-Divergence and Curl.

Vector integration: Line integral - work done, surface integral, Green's theorem in the plane (without proof), Stoke's theorem (without proof), volume integral, divergence theorem (without proof) and related problems**.**

Prescribed Textbooks:

1. E. Kreyszig. Advanced Engineering Mathematics. 10th Ed., John Wiley & Sons, 2011.
2. B. S. Grewal. Higher Engineering Mathematics, 44th Ed., Khanna Publishers, 2017.

Reference Books:

1. B. V. Ramana. Higher Engineering Mathematics. Mc Graw Hill Education
2. G. B. Thomas. Maurice D. Weir and Joel Hass. Thomas Calculus, 13th Ed., Pearson Publishers, 2013
3. R.L. Garg Nishu Gupta. Engineering Mathematics Volumes-I &II. Pearson Education
4. H. K. Das, Er. Rajnish Verma. Higher Engineering Mathematics. S. Chand

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The Engineer and world	Ethics	Individual and Collaborative teamwork	Communication	Project management and finance	Life-long learning
24AMAT11T.1	2	2	1	1	-	-	-	-	-	-	1
24AMAT11T.2	3	2	1	2	-	-	-	-	-	-	1
24AMAT11T.3	3	3	2	2	-	-	-	-	-	-	1
24AMAT11T.4	2	2	1	1	-	-	-	-	-	-	1
24AMAT11T.5	3	2	1	2	-	-	-	-	-	-	1

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RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course: **Computational Problem Solving**
Category: ES
Semester: I Semester
Course Code: 24ACSE11T
Branch/es: Common to all branches

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:

1. Understanding the steps in problem solving and formulation of algorithms to problems.
2. Develop programming skills as a means of implementing an algorithmic solution with appropriate control and data structures.
3. Develop intuition to enable students to come up with creative approaches to problems.
4. Develop programs using pointers, structures and unions.
5. Manipulation of text data using files.

Course Outcomes:

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

1. Demonstrate solutions to problems and represent those using algorithms/flowcharts.
2. Choose proper control statements and use arrays for solving problems.
3. Decompose a problem into modules and use functions to implement the modules.
4. Apply and use allocation of memory for pointers and solve the problems related to manipulation of text data using files and structures.
5. Develop the solutions for problems using c programming language.

Unit 1 **Problem Solving and Introduction to C** **9**

Steps to solve problems, algorithm, Pseudo code, Flowchart with examples, Program Development. Environments. Introduction to programming: Programming languages and generations.
Introduction to C: Introduction, structure of C program, keywords, identifiers, Variables, data types, constants, I/O statements, operators, precedence and associatively

Unit 2 **Introduction to decision control statements and Arrays** **9**

Selective, looping and nested statements, jumping statements.
Arrays: Introduction, declaration of arrays, accessing and storage of array elements, searching (linear and binary search algorithms) and sorting (selection and bubble) algorithms, multidimensional arrays, matrix operations

Unit 3 **Strings and Functions** **9**

Strings: Declaration and Initialization, String Input / Output functions, String manipulation functions.
Functions: Types of functions, recursion, scope of variables and storage classes.
Preprocessor Directives: Types of preprocessor directives, examples

Unit 4 Pointers **9**

Pointers: Understanding computer 's memory, introduction to pointers, declaration pointer variables, pointer arithmetic, pointers and strings, array of pointers, function pointers, dynamic memory allocation, advantages and drawbacks of pointers

Unit 5 Structures and Files **9**

Structures: Structure definition, initialization and accessing the members of a structure, nested structures, array of structures, structures and functions, structures and pointers, self-referential structures, unions and enumerated data types.

Files: Introduction to files, file operations, reading and writing data on files, error handling during file operations.

Prescribed Textbooks:

1. C Programming and Data Structures. B.A. Forouzan, R. F.Gilberg, Cengage learning, Indian edition.
2. C and Data Structures, E.Balaguruswamy, Tata McGraw Hill.
3. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. Ananda Rao, Pearson Education.

Reference Books:

1. LET US C, YeswanthKanitkar, Ninth Edition, BPB Publication.
2. Byron Gottfried, Schaum 's‖ Outline of Programming with C‖, McGraw-Hill.
3. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.
4. A K Sharma —Computer Fundamentals and Programming‖, 2nd Edition, University Press, 2018.
5. PradeepDey and Manas Ghosh, —Programming in C‖, Oxford Press, 2ndEdition, 2017.
6. ReemaTharaja —Introduction to C Programming‖, Second Edition, OXFORD Press, 2015

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The Engineer and world	Ethics	Individual and Collaborative teamwork	Communication	Project management and finance	Life-long learning
24ACSE11T.1	3	2	1	2	-	-	-	-	-	-	-
24ACSE11T.2	3	3	2	2	-	-	-	-	-	-	-
24ACSE11T.3	3	3	2	2	-	-	-	-	-	-	3
24ACSE11T.4	3	2	1	2	-	-	-	-	-	-	3
24ACSE11T.5	3	3	3	3	-	-	-	-	-	-	3

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RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	**Engineering & IT Workshop**	
Category:	ES	
Semester:	I Semester	II Semester
Course Code:	24AMEC12L	24AMEC22L
Branch/es:	CSE, CSE(DS), CSE(AIML) & AI&ML	CE, ME, EEE, ECE, CSE(AI), AI&DS & CSE(ICB)

Lecture Hours	Tutorial Hours	Practice Hours	Credits
1	0	4	3

Engineering Workshop Syllabus:

Course Objectives:

This course will enable the student to

1. Make familiar with different types of wooden joints.
2. Make conversant with tools used in sheet metal work.
3. Develop electrical wiring skills.
4. Have practical exposure to metal joining processes.
5. Gain knowledge with tools used in Plumbing and Fitting

Course Outcomes:

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

1. Apply wood working skills to prepare different joints.
2. Develop sheet metal jobs with gi sheet.
3. Apply basic electrical engineering knowledge for house wiring practice.
4. Operate on different metal joining equipment.
5. Apply practical skills in trouble shooting the plumbing systems and various fittings.

Unit 1 Wood Working **6**

Familiarity with different types of woods and tools used in wood working and making following joints.

a) Cross- Lap joint b) Mortise and Tenon joint

Unit 2 Sheet Metal Working **6**

Familiarity with different types of tools used in sheet metal working, Developments of following sheet metal job from GI sheet.

a)rectangular tray b) Conical funnel

Unit 3 Electrical Wiring **6**

Familiarity with different types of basic electrical circuits and make the following connections.

a) Series connection and two switches, two bulbs in parallel connection.

b) Staircase connection and tube light connection.

Unit 4 Metal Joining process **9**

Familiarity with different types of tools used in metal joining process and practice on
a) Soldering
b) Brazing (preparation of Butt joint)
c) Arc welding (Preparation of Lap joint)

Unit 5 Demonstration & Practice 3

Demonstration and practice of Plumbing tools, Preparation of Pipe joints with coupling for same diameter and with reducer for different diameters.

a) Tap Connection

(For practice: branches other than civil & mechanical. For Demonstration: civil & mechanical Branch) Demonstration and practice of fitting tools.

b) Familiarity with different types of tools used in fitting and do the following fitting **Exercise**s.

a) Square-Fit
b) Dove-tail Fit

(For practice: civil & mechanical.
For Demonstration: branches other than civil & mechanical.)

Prescribed Textbooks:

1. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai & Co., 2015 & 2017.
2. Kannaiah P. and Narayana K.L., Workshop Manual, 3rd Edn, Scitech publishers.

Reference Books:

1. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition
2. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.
3. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul Prakashan, 2021-22.
4. Jeyapoovan T. and Pranitha S., Engineering Practices Lab Manual, 3rd Edn. Vikas Pub.2008.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The Engineer and world	Ethics	Individual and Collaborative teamwork	Communication	Project management and finance	Life-long learning
24AMEC12L/22L.1	3	3	1	-	-	-	1	2	2	-	2
24AMEC12L/22L.2	3	3	2	-	-	-	1	2	2	-	2
24AMEC12L/22L.3	3	3	1	-	-	-	1	2	2	-	2
24AMEC12L/22L.4	3	3	1	-	-	-	1	2	2	-	2
24AMEC12L/22L.5	3	3	1	-	-	-	1	2	2	-	2

IT Workshop Syllabus:

Course Objectives:

This course will enable the student to

1. Demonstrate the disassembling and assembling of a personal computer system.
2. Demonstrate the Installation the operating system and other software required in a personal computer system.
3. Introduce connecting the PC on to the internet from home and work place and effectively usage of the internet, Usage of web browsers, email, news groups and discussion forums.
4. Introduce the usage of Productivity tools in crafting professional word documents, excel spreadsheets and power point presentations.
5. To utilize Cloud based productivity enhancement and collaboration tools

Course Outcomes:

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

1. Interpret the peripherals of a computer, perform assembling and disassembling of various components of a computer.
2. Illustration of installation and un-installation of Windows and Linux operating systems and also perform troubleshooting of various hardware and software components
3. Discuss about Web browsers to access Internet, Search Engines
4. Apply and use word processor; spread sheet, presentation and data storage tools
5. Analyze and Implement Cloud based productivity enhancement and collaboration tools

Task 1 **2**

Learn about Computer: Identify the internal parts of a computer, and its peripherals. Represent the same in the form of diagrams including Block diagram of a computer. Write specifications for each part of a computer including peripherals and specification of Desktop computer. Submit it in the form of a report

Task 2 **2**

Assembling a computer: Disassemble and assemble the PC back to working condition. Students should be able. Student should Students should record the process of assembling and troubleshooting a computer.

Task 3 **2**

Install Operating System: Student should install Linux on the computer. Students should record the entire installation process.

Task 4 **2**

Networking: Students should connect two computers directly using a cable or wireless connectivity and share information. Students should connect two or more computers using switch/hub and share information. Crimpling activity, logical configuration etc. should be done by the student. The entire process has to be documented.

Task 5 **2**

Browsing Internet: Student should access the Internet for Browsing. Students should search the Internet for required information. Students should be able to create e-mail accounts and send emails. They should get acquaintance with applications like Facebook, skype etc. If Intranet mailing facility is available in the organization, then students should share the information using it. If the operating system supports sending messages to multiple users (LINUX supports it) in the same network, then it should be done by the student.

Students are expected to submit the information about different browsers available, their features, search process using different natural languages, and creating e-mail account.

Task 6 **2**

Antivirus: Students should download freely available Antivirus software, install it and use it to check for threats to the computer being used. Students should submit information about the features of the antivirus used, installation process, about virus definitions, virus engine etc.

Task 7 **4**

Word Processor: Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, inserting header and Footer, changing the font, changing the colour, including images and tables in the word file, making page setup, copy and paste block of text, images, tables, linking the images which are present in other directory, formatting paragraphs, spell checking, etc. Students should be able to prepare project cover pages, content sheet and chapter pages at the end of the task using the features studied. Students should submit a user manual of the word processor considered.

Task 8 **4**

Spreadsheet: Students should be able to create, open, save the application documents and format them as per the requirement. Some of the tasks that may be practiced are Managing the worksheet environment, creating cell data, inserting and deleting cell data, format cells, adjust the cell size, applying formulas and functions, preparing charts, sorting cells. Students should submit a user manual of the Spreadsheet application considered

Task 9 **4**

Presentations: creating, opening, saving and running the presentations, selecting the style for slides, formatting the slides with different fonts, colors, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyper linking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.

Task 8 **2**

Store, sync, and share files with ease in the cloud-Google Drive
Document creation and editing text documents in your web browser- Google docs

Prescribed Textbooks:

1. Introduction to Information Technology, ITL Education Solutions limited,Pearson Education.
2. Upgrading and RepairingPC's, 22nd Edition, Scott Muller QUE, PearsonEducation
3. Comdex Information Technology Course Kit, Vikas Gupta, WILEYDreamtech
4. MOS 2010 Study Guide for Microsoft Word, Excel, PowerPoint, and Outlook Exams, 1st Edition, Joan Lambert, Joyce Cox, Microsoft Press

Reference Books:

1. IT Essentials PC Hardware and Software Companion Guide, CICSO Networking Academy
2. Network Your Computer & Devices Step by Step 1st Edition, CiprianRusen, Microsoft Press
3. Troubleshooting, Maintaining & Repairing PCs, 5th Edition, Bigelow, TMH
4. Introduction to computers, Peter Norton, 6/e, Mc Graw Hill
5. Cloud computing, productivity and collaboration tools, software and products offered by Google: https://en.wikipedia.org/wiki/G_Suite

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The Engineer and world	Ethics	Individual and Collaborative teamwork	Communication	Project management and finance	Life-long learning
24AMEC12L/22L.1	3	2	1	2	-	-	-	-	-	-	-
24AMEC12L/22L.2	3	2	1	2	-	-	-	-	-	-	-
24AMEC12L/22L.3	3	3	2	2	-	-	-	-	-	-	-
24AMEC12L/22L.4	3	2	1	2	-	-	-	-	-	-	-
24AMEC12L/22L.5	3	3	2	2	-	-	-	-	-	-	-

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	**English Language Communication Skills Lab**	
Category:	Humanities	
Semester:	I Semester	II Semester
Course Code:	24AENG11L	24AENG21L
Branch/es:	CSE, CSE(DS), CSE(AIML), AI&ML	AI&DS, CE, CSE(AI), CSE(ICB), ECE, EEE, ME

Lecture Hours	Tutorial Hours	Practice Hours	Credits
-	-	2	1

Course Objectives: The main objective of introducing this course is to expose the students to a variety of self-instructional, learner-friendly modes of language learning. The students will get trained in basic communication skills.

Course Outcomes:

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

1. Relate and differentiate English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension
2. Develop communication skills through various language learning activities
3. Demonstrate professional skills in participating role-plays and descriptions
4. Build effective resonate and equip themselves with employability skills
5. Enhance public speaking skills and deliver oral presentations with clarity and confidence

List of Topics

1. Phonetics: Vowels / Consonants; Accent Rules
2. Just a Minute
3. Role Play / Situational Dialogues
4.Oral Presentation
5. Information Transfer
6. Describing people/Objects/Situations

Suggested Software

1. Sky Pronunciation Suite
2. Clarity Pronunciation Power – Part I
3. Learning to Speak English - 4 CDs
4. Lose Your Accent in 28 days, CD Rom, Judy Ravin

Reference Books:

1. Meenakshi Raman, Sangeeta-Sharma. Technical Communication. Oxford Press, 2018.
2. Grant Taylor. English Conversation Practice. Tata McGraw-Hill Education India, 2016.
3. Hewing's, Martin. Cambridge Academic English (B2). CUP, 2012.
4. T. Balasubramanyam. A Textbook of English Phonetics for Indian Students. 3rd Ed., Trinity Press.

Web Resources:

Spoken English:

1. www.esl-lab.com
2. www.englishmedialab.com
3. www.englishinteractive.net
4. https://www.britishcouncil.in/english/online
5. http://www.letstalkpodcast.com/
6. https://www.youtube.com/c/mmmEnglish_Emma/featured
7. https://www.youtube.com/c/ArnelsEverydayEnglish/featured
8. https://www.youtube.com/c/engvidAdam/featured
9. https://www.youtube.com/c/EnglishClass101/featured
10. https://www.youtube.com/c/SpeakEnglishWithTiffani/playlists
11. https://www.youtube.com/channel/UCV1h_cBE0Drdx19qkTM0WNw

Voice & Accent:

1. https://www.youtube.com/user/letstalkaccent/videos
2. https://www.youtube.com/c/EngLanguageClub/featured
3. https://www.youtube.com/channel/UC_OskgZBoS4dAnVUgJVexc
4. https://www.youtube.com/channel/UCNfm92h83W2i2ijc5Xwp_IA

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The Engineer and world	Ethics	Individual and Collaborative teamwork	Communication	Project management and finance	Life-long learning
24AENG11L/21L.1	-	-	-	-	-	-	1	1	3	-	1
24AENG11L/21L.2	-	-	-	-	-	-	1	1	3	-	1
24AENG11L/21L.3	-	-	-	-	-	-	1	1	3	-	1
24AENG11L/21L.4	-	-	-	-	-	-	1	1	3	-	1
24AENG11L/21L.5	-	-	-	-	-	-	1	1	3	-	1

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	**Applied Physics Lab**	
Category:	BS	
Semester:	I Semester	II Semester
Course Code:	24APHY11L	24APHY21L
Branch/es:	CSE, CSE(DS), CSE(AIML) & AI&ML	EEE, ECE, CSE(AI), AI&DS & CSE(ICB)

Lecture Hours	Tutorial Hours	Practice Hours	Credits
-	-	2	1

Course Objectives: This course aims to provide a comprehensive understanding of interference and diffraction, including their practical applications and the significance of optical fiber parameters in communication. It emphasizes the role of energy gaps in semiconductor conductivity and the Hall effect, explores the applications of magnetic and dielectric materials, and applies semiconductor principles to various electronic devices.

Course Outcomes:

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

1. Operate various optical instruments to measure optical parameters.
2. Determine the magnetic and dielectric parameters by various methods.
3. Evaluate various parameters of semiconductors by different methods.
4. Estimate general parameters of materials.

List of Experiments

1. Determination of the thickness of the wire using wedge method.
2. Determination of the radius of curvature of the lens by Newton's ring method.
3. Determination of wavelength of light radiation using plane diffraction grating by spectrometer.
4. Determination of Dispersive power of a diffraction grating.
5. Determination of Particle size using laser.
6. Determination of dielectric constant by bridge resonance method.
7. Determination of Magnetic field along the axis of a circular coil carrying current by stewart-Gee's method.
8. Determination of Wavelength of laser by using Diffraction grating.
9. Determination of Hysteresis loss of ferro magnetic material by tracing B-H curve.
10. Determination of the numerical aperture and acceptance angle of an optical fiber.
11. Determination of the rigidity modulus of metal wire by using torsional pendulum.
12. Determination of Hall coefficient and carrier concentration of a given semiconductor using Hall effect.
13. Determination of the resistivity of semiconductor by Four probe method.
14. Determination of the energy gap of a semiconductor by using P-N Junction diode.
15. Determination of resistance with varying temperature using thermistor

Reference Books:

1. S. Balasubramanian, M.N. Srinivasan. A Textbook of Practical Physics. S Chand Publishers, 2017
2. C.V. Madhusudan Rao, V. Vasanth kumar. Engineering Physics laboratory. SciTech publications, 2010

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The Engineer and world	Ethics	Individual and Collaborative teamwork	Communication	Project management and finance	Life-long learning
24APHY11L/21L.1	3	2	1	2	3	-	-	-	-	-	3
24APHY11L/21L.2	3	2	1	2	3	-	-	-	-	-	3
24APHY11L/21L.3	3	2	2	2	3	-	-	-	-	-	3
24APHY11L/21L.4	3	2	2	2	3	-	-	-	-	-	3

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	**Computational Problem-Solving Lab**
Category:	ES
Semester:	I Semester
Course Code:	24ACSE11L
Branch/es:	Common to all branches

Lecture Hours	Tutorial Hours	Practice Hours	Credits
-	-	2	1

Course Objectives:

1. Setting up programming environment.
2. Develop Programming skills to solve problems.
3. Use of appropriate C programming constructs to implement algorithms.
4. Identification and rectification of coding errors in program
5. Develop applications using a modular programming and Manage data using files

Course Outcomes:

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

1. Identify and setup program development environment
2. Develop the algorithms using c programming language constructs
3. Analyze and rectify the syntax errors and debug program for semantic errors
4. Demonstrate problems in a modular approach using functions
5. Assessing file operations with simple text data

A minimum number of FOUR programs from each **Exercise** is to be done students.

Data Types, Constants, Input and Output and expressions

Exercise 1: Data types, Variables, Constants and Input and Output.
Exercise 2: Operators, Expressions and Type Conversions.

Decision Control Statements and Arrays

Exercise 3: Conditional Statements [two way and multipath].
Exercise 4: Loop Control Statements. [for, while and do-While]
Exercise 5: Unconditioned JUMP Statements- break, continue, goto.
Exercise 6: Declaring Arrays, Referencing Arrays, Array Subscripts. Using for loop for sequential Access.
Exercise 7: Multidimensional Arrays

Strings and Functions

Exercise 8: String Basics, String Library Functions and Array of Strings.
Exercise 9: Simple user defined functions, Parameter passing methods- pass by value, pass by reference.
Exercise 10: Storage classes- Auto, Register, Static and Extern
Exercise 11: Recursive Functions, Preprocessor commands.
Exercise 12: Array Elements as Function Arguments

Pointers

Exercise 13: Pointers, Dynamic memory allocation and error handling

Structures and Files

Exercise 14: Structures
Exercise 15: File handling

Prescribed Textbooks:

1. C Programming and Data Structures. B.A. Forouzan, R. F.Gilberg,Cengage learning, Indian edition
2. C and Data Structures, E.Balaguruswamy, Tata McGraw Hill
3. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. Ananda Rao, Pearson Education

Reference Books:

1. Let Us C, YeswanthKanitkar, Ninth Edition, BPB Publication
2. A K Sharma —Computer Fundamentals and Programming‖, 2nd Edition, University Press, 2018
3. PradeepDey and Manas Ghosh, —Programming in C‖, Oxford Press, 2ndEdition, 2017
4. ReemaTharaja —Introduction to C Programming‖, Second Edition, OXFORD Press, 2015
5. https://www.cprogramming.com/
6. https://www.mycplus.com/tutorials/c-programming-tutorials

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The Engineer and world	Ethics	Individual and Collaborative teamwork	Communication	Project management and finance	Life-long learning
24ACSE11L.1	3	2	1	2	-	-	-	-	-	-	-
24ACSE11L.2	3	3	3	3	-	-	-	-	-	-	-
24ACSE11L.3	3	3	2	2	-	-	-	-	-	-	3
24ACSE11L.4	3	2	1	2	-	-	-	-	-	-	3

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course: **Language Elective**
Category: Humanities
Semester: I Semester
Course Code: 24ALAN11T
Branch/es: Common to all branches

Lecture Hours	Tutorial Hours	Practice Hours	Credits
1	0	0	1

Course Objectives: The course aims to enhance students' global communication skills through foreign language acquisition while fostering cultural awareness and appreciation of diverse backgrounds. It provides a flexible learning platform with a range of reputable online courses, empowering students to tailor their educational experiences. Additionally, the course allows to focus on career development by equipping students with valuable language skills that enhance their employability.

Course Outcomes:
At the end of the course, the student will be able to
1. Enhance their global communication skills by learning foreign language of their choice.
2. Understand cultural diversity
3. Apply a variety of reputed online courses and enjoy flexible learning
4. Acquire additional language skills to secure suitable job opportunities
5. Analyze the ability in self-paced learning

Guidelines:

1. Course Selection: Students can choose from the following languages:
- German
- French
- Spanish
- Arabic

2. Approved Platforms: Courses must be taken from recognized MOOC platforms such as NPTEL, Coursera, Udemy, or edX.

3. List of recommended courses:
- German: https://www.udemy.com/course/german-course-for-beginners-learn-german
- French: https://www.udemy.com/course/complete-french-course
- Spanish: https://www.udemy.com/course/el-metodo-spanish-1
- Arabic: https://www.udemy.com/course/arabic-a21/

4.Enrolment Verification: Students must submit proof of enrolment in the chosen course to the academic office of I Year at the beginning of the semester.

5. Minimum Course Duration: The selected course should be a minimum of 4 weeks in duration.

6. Progress Reports: Students are encouraged to submit progress reports periodically to their course mentor.

7. Completion Deadline: The course must be completed by the end of the semester.

8. Certificate Submission: Students must submit the certificate of completion issued by the MOOC platform to the Head, First Year Academics.

Policies

1. Credit Allocation: Upon successful completion and submission of the certificate, students will be awarded 1 academic credit.
2. Grading: The course will be graded on a Pass/Fail basis. A pass grade is awarded upon verification of the completion certificate.
3. Integrity and Authenticity: The submitted certificate must be authentic and verifiable. Any attempt to submit falsified documents will result in disciplinary action.
4. Support: Students can seek support from language faculty/course mentors if they encounter any difficulties during the course.
5. Non-Completion: Failure to complete the course within the stipulated time frame will result in no credit being awarded, and the elective will need to be retaken

A committee shall be formed at the level of the University to evaluate the grades / marks given for a course by external agencies and convert to the equivalent marks / grades. The recommended conversions and appropriate grades / marks are to be approved by the Academic Council of the University.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The Engineer and world	Ethics	Individual and Collaborative teamwork	Communication	Project management and finance	Life-long learning
24ALAN11T.1	-	-	-	-	-	-	-	-	2	-	1
24ALAN11T.2	-	-	-	-	-	-	-	-	2	-	1
24ALAN11T.3	-	-	-	-	-	-	-	-	2	-	1
24ALAN11T.4	-	-	-	-	-	-	-	-	2	-	1
24ALAN11T.5	-	-	-	-	-	-	-	-	2	-	1

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	**Chemistry**	
Category:	BS	
Semester:	I Semester	II Semester
Course Code:	24ACHE11T	24ACHE21T
Branch/es:	EEE, ECE, CSE(AI), AI&DS, CSE (ICB)	CSE, CSE(DS), CSE(AIML), AIML

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives: The course aims to familiarize students with the fundamentals of engineering chemistry and its practical applications. It provides training on key principles of electrochemistry and polymers, while also introducing students to various instrumental methods. Additionally, the course highlights the importance of green energy and e-waste management, emphasizing their relevance in modern engineering practices.

Course Outcomes:

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

1. Discuss quantum mechanics and molecular orbital theory to interpret bonding, energy levels, and bond order in various molecules.
2. Demonstrate the construction and functionality of various sensors, batteries, and fuel cells through practical examples.
3. Summarize the preparation, characteristics, and applications of various polymers in real-world contexts.
4. Utilize principles of various analytical techniques to evaluate nanomaterials effectively.
5. Analyze sustainable energy solutions and develop strategies for effective e-waste management.

Unit 1 Structure and bonding models **9**

Fundamentals of Quantum mechanics, Schrodinger wave equation, significance of Ψ and Ψ2, particle in one dimensional box, molecular orbital theory – bonding in homo and heteronuclear diatomic molecules – energy level diagrams of O2 and CO, etc. π-molecular orbitals of butadiene and benzene, calculation of bond order.

Unit 2 Electrochemistry and applications **8**

Electrochemical cell, Nernst equation, cell potential calculations and numerical problems, types of electrodes - indictor and reference electrodes. Electrochemical sensors – potentiometric and amperometric sensors with examples.

Primary cells – Dry cell, secondary cells – Lithium-ion batteries - working of the batteries including cell reactions; Fuel cells, Hydrogen-Oxygen fuel cell – working of the cell.

Unit 3 Polymer chemistry **8**

Introduction to polymers, functionality of monomers, Thermoplastics and Thermo-setting plastics, properties and applications of PVC and Bakelite.

Fibres - polyesters, mechanical requirements for fibres - crystallinity, stress strain curves. Biodegradable polymers - properties and applications of Poly Glycolic Acid (PGA), Polylactic Acid (PLA).

Elastomers – properties and applications of Buna-S, Buna-N, Thiokol.

Conducting polymers – Polyacetylene – mechanism of conduction and applications.

Unit 4 Nanomaterials and instrumental methods 9

Nanomaterials - Introduction, classification, synthesis of nanomaterial by Sol-gel method, properties and applications of carbon-based nanomaterials - CNT and Graphene.

Electromagnetic spectrum, absorption of radiation: Beer-Lambert's law. UV-Visible spectroscopy, principle, instrumentation and applications, IR spectroscopy – principle, instrumentation and applications, Potentiometry - potentiometric titrations (redox titrations), Conductometric titrations (acid-base titrations).

Unit 5 Alternative energy sources and e-waste management 8

Green Fuels: Introduction, construction and working of photovoltaic cell, applications, generation of green hydrogen energy by electrolysis of water and its advantages.

e-waste management: Introduction, sources of e-waste, composition and health hazards of toxic materials present in electronic and electrical e-waste, need for e-waste management, recycling and recovery; different approaches of recycling, extraction of Gold from e-Waste.

Prescribed Textbooks:

1. Jain, Jain. Engineering Chemistry. 16th Ed., Dhanpat Rai, 2013.
2. Atkins, Peter, Julio de Paula, and James Keeler. Atkins' Physical Chemistry. 10th Ed., Oxford University Press, 2010.
3. Jing, Dengwei. Handbook of Hydrogen Energy. 1st Ed., Wiley-VCH, 2023.
4. Fowler, Bruce A. Electronic Waste: Toxicology and Public Health Issues. 1st Ed., Academic Press, 2017.

Reference Books:

1. Skoog, Douglas A., F. James Holler, Stanley R. Crouch. Principles of Instrumental Analysis. 7th ed., Cengage Learning, 2016.
2. Lee, J.D. Concise Inorganic Chemistry. 5th ed., Wiley-Blackwell, 1999.
3. Billmayer, Fred W. Jr. Textbook of Polymer Science. 3rd ed., Wiley, 2007.
4. Sherif, S.A., D. Yogi Goswami, E.K. Stefanakos, A. Steinfeld. Handbook of Hydrogen Energy. CRC Press, 2014

CO-PO Mapping:

Course outcomes	Engineering Knowledge	Problem Analysis	Design/Development t of solutions	Conduct investigations of Complex Problems	Engineering tools usage	The Engineer and World	Ethics	Individual and collaborative teamwork	Communication	Project Ma engagement and Finance	Life-long Learning
24ACHE11T/21T.1	2	2	1	1	-	-	-	-	-	-	1
24ACHE11T/21T.2	3	2	1	2	-	-	-	-	-	-	1
24ACHE11T/21T.3	3	2	1	2	-	-	-	-	-	-	1
24ACHE11T/21T.4	3	2	1	2	-	-	-	-	-	-	1
24ACHE11T/21T.5	3	3	2	2	-	-	-	-	-	-	1

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course: **Differential Equations and Transform Techniques**
Category: BS
Semester: II Semester
Course Code: 24AMAT21T
Branch/es: Common to all branches

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives: The course aims to develop proficiency in solving ordinary and partial differential equations, emphasizing their application in engineering and scientific contexts. It will cover Laplace Transforms and their inverses, illustrating their role in solving engineering and real-world problems. Additionally, the course will introduce Fourier Series and Fourier Transforms, focusing on their practical applications for addressing real-life challenges

Course Outcomes:
At the end of the course, the student will be able to
1. Describe the application of higher order differential equations with constant coefficients in modeling dynamic systems.
2. Solve the standard partial differential equations relevant to engineering scenarios.
3. Utilize the Laplace transformations to handle various types of functions in engineering context.
4. Analyze ordinary differential equations by employing Laplace transformations for solutions derivation.
5. Apply Fourier series and Fourier transforms in engineering context.

Unit 1 **Linear differential equations of higher order with constant Coefficients** **10**

Basic concepts - general solution-operator D-rules for finding complimentary function-inverse operator-rules for finding particular integral for RHS term of the type eax , sin ax / cos ax , polynomials in x, eax sin ax / eax cos ax / eaxxn, xsin ax / x cos ax -method of variation of parameters

Unit 2 **Partial Differential Equations** **8**

Introduction and formation of Partial Differential Equations by elimination of arbitrary constants and arbitrary functions, solutions of first order linear equations using Lagrange's method, non-linear PDEs (Charpit's method), method of separation of variables for second order linear partial differential equations.

Unit 3 **Laplace transforms** **8**

Laplace transforms of standard functions- first shifting theorem - change of scale property - multiplication by tn - division by t - transforms of derivatives and integrals - Unit step function – second shifting theorem– Laplace transform of periodic functions (without proofs).

Unit 4 **Inverse Laplace transforms** **8**

Inverse Laplace transforms (without proofs) – Convolution theorem (without proof).
Applications of Laplace transforms to ordinary differential equations of first and second order with constant coefficients.

Unit 5 Fourier series and Fourier Transforms 10

Fourier series: Dirichlet conditions - functions of any period - odd and even functions - half range series. **Fourier Transforms:** Fourier integrals - Fourier cosine and sine integrals - Fourier transform - sine and cosine transform.

Prescribed Textbooks:

1. E. Kreyszig. Advanced Engineering Mathematics. 10th Ed., John Wiley & Sons, 2011.
2. B. S. Grewal. Higher Engineering Mathematics. 44th Ed., Khanna Publishers, 2017.

Reference Books:

1. B. V. Ramana. Higher Engineering Mathematics. Mc Graw Hill Education.
2. G. B. Thomas, Maurice D. Weir and Joel Hass. Thomas Calculus. 14th Ed., Pearson Publishers, 2022.
3. D. G. Zill. Advanced Engineering Mathematics. 6th Ed., Jones and Bartlett, 2016
4. Glyn James. Advanced Modern Engineering Mathematics. 5th Ed., Pearson publishers, 2018.
5. R. K. Jain and S. R. K. Iyengar. Advanced Engineering Mathematics. 5th Ed., Alpha Science International Ltd., 2021 (9th reprint).

CO-PO Mapping:

Course outcomes	Engineering Knowledge	Problem Analysis	Design/Development t of solutions	Conduct investigations of Complex Problems	Engineering tools usage	The Engineer and World	Ethics	Individual and collaborative teamwork	Communication	Project Ma engagement and Finance	Life-long Learning
24AMAT21T.1	2	2	1	1	-	-	-	-	-	-	1
24AMAT21T.2	3	2	1	2	-	-	-	-	-	-	1
24AMAT21T.3	3	2	1	2	-	-	-	-	-	-	1
24AMAT21T.4	3	3	2	2	-	-	-	-	-	-	1
24AMAT21T.5	3	2	1	2	-	-	-	-	-	-	1

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	**Basic Electrical and Electronics Engineering**	
Category:	BS	
Semester:	I Semester	II Semester
Course Code:	24AEEE11T	24AEEE21T
Branch/es:	CE, ME, EEE, ECE, CSE(AI), AI&DS & CSE(ICB)	CSE, CSE-DS, CSE-AIML & AIML

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:

1. To understand the fundamental laws and circuit elements.
2. To analyze the working of various Machines.
3. To Summarize the different Energy Resources, various Measuring Instruments and importance of Safety Measures.
4. To Describe the various Electronic Devices.
5. To Illustrate the concepts of Bipolar Junction transistor and Diode Applications.

Course Outcomes:

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

1. Understand the fundamental laws and circuit elements.
2. Analyze the working of dc and ac machines.
3. Summarize the different energy resources, various measuring instruments and importance of safety measures
4. Analyze basic semiconductor devices
5. Illustrate the concepts of bipolar junction transistor and diode applications.

Unit 1 Fundamental Laws and Electrical Circuits 9

Basic definitions - Voltage, current, power, energy, charge, flux, static and dynamic emf, Faraday's laws of electromagnetic induction, Fleming's right-hand rule, Fleming's left-hand rule, Lenz's law, Corkscrew rule, Right hand thumb rule, Right hand palm rule. Types of elements, Types of sources, ohms law, resistive, inductive, capacitive networks, Series-parallel circuits and Kirchhoff's laws- (Basic Numerical Problems).

Unit 2 DC and AC Machines 9

DC Generator: Constructional Details of DC machine, Principle of operation, emf equation, types of generators, applications. (Basic Numerical Problems on EMF equation)

DC Motor: principle of operation, torque equation, types, losses and efficiency, applications, Brake test, Speed control methods. (Basic Numerical Problems).

AC machines: 1-Φ Transformer: Principle of operation, emf equation, losses, efficiency and regulation calculations using OC and SC tests-Three Phase Induction Motor construction and working principle.

Unit 3 Energy Resources, Measuring Instruments & Safety Measures 9

Energy Resources: Conventional and non-conventional energy resources; Layout and operation of Hydel, Solar & Wind power generation. **Measuring Instruments:** Construction and working principle of Permanent Magnet Moving Coil (PMMC), Moving Iron (MI) Instruments, Multi-meter, CRO, DSO and Function generator. **Equipment Safety Measures:** Working principle of Fuse and Miniature circuit breaker

(MCB), merits and demerits. Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.

Unit 4 Diode Applications and Introduction to Transistors 9

Half Wave and Full Wave Rectifiers – General Filter Considerations – Capacitor Filter. Transistor constructions – Types, Transistor operation in CB, CE and CC configurations and their Characteristics.

Unit 5 Fourier series and Fourier Transforms 10

Fourier series: Dirichlet conditions - functions of any period - odd and even functions - half range series. **Fourier Transforms:** Fourier integrals - Fourier cosine and sine integrals - Fourier transform - sine and cosine transform.

Prescribed Textbooks:

1. A.Sudhakar and Shyammohan S Palli, "Circuits and Networks" McGraw Hill, 2018.
2. A.Chakrabarti," Circuit Theory-Analysis and Synthesis", Dhanpat Rai &Co,2010.
3. S.Salivahanan, N.Suresh Kumar, "Electronic Devices and Circuits" McGraw Hill, 2011

Reference Books:

1. D.P.Kothari and I.J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2. D.C.Kulshreshta, "Basic Electrical Engineering", McGraw Hill, 2009.
3. P.S.Dhogal, "Basic Electrical Engineering with Numerical Problems" McGraw Hill
4. C.L Wadhwa, "Electric Power Generation, Distribution and Utilization", New Age Inter. (P) Ltd., 2005.
5. G.D. Rai, "Non- Conventional Energy Sources", Khanna Publishers, 2000.

CO-PO Mapping:

Course outcomes	Engineering Knowledge	Problem Analysis	Design/Development t of solutions	Conduct investigations of Complex Problems	Engineering tools usage	The Engineer and World	Ethics	Individual and collaborative teamwork	Communication	Project Ma engagement and Finance	Life-long Learning
24AEEE11T/21T.1	2	2	1	1	-	-	-	-	-	-	1
24AEEE11T/21T.2	3	3	2	2	-	-	-	-	-	-	1
24AEEE11T/21T.3	2	2	1	1	-	-	-	-	-	-	1
24AEEE11T/21T.4	3	3	2	2	-	-	-	-	-	-	1
24AEEE11T/21T.5	3	2	1	1	-	-	-	-	-	-	1

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course: **Data Structures**
Category: ES
Semester: II Semester
Course Code: 24ACSE21T
Branch/es: CSE, AI&DS, AIML, CSE(ICB), CSE(AI), CSE(DS), CSE(AIML)

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:

1. Understand the significance of linear data structures in problem-solving and basic time/space complexity analysis.
2. Create and manage linked lists to efficiently organize and manipulate data, emphasizing memory efficiency.
3. Implement and apply stacks and queues to manage program flow and solve problems involving expression evaluation and backtracking.
4. Understand the importance of non-linear data structures Tress and Graphs.
5. Explore basic concepts of hashing and apply it to solve problems requiring fast data retrieval and management.

Course Outcomes:

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

1. Interpret the role of linear data structures in organizing and accessing data efficiently
2. Apply linked lists for dynamic data storage and understanding of memory allocation.
3. Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems.
4. Analyze queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between de-queues and priority queues and apply them appropriately to solve data management challenges.
5. Recognize scenarios where hashing is advantageous, and design hash-based solutions for specific Problems.

Unit 1 Introduction to Linear Data Structures **9**

Introduction to Linear Data Structures: Definition and importance of linear data structures, Abstract data types (ADTs) and their implementation, Overview of time and space complexity analysis for linear data structures.

Unit 2 Linked Lists **9**

Linked Lists: Singly linked lists: representation and operations, doubly linked lists and circular linked lists, Comparing arrays and linked lists, Applications of linked lists.

Unit 3 Stacks, Queues and De-queues **9**

Stacks: Introduction to stacks: properties and operations, implementing stacks using arrays and linked lists, Applications of stacks in expression evaluation, backtracking, reversing list etc.

Queues: Introduction to queues: properties and operations, implementing queues using arrays and linked lists, Applications of queues in breadth-first search, scheduling, etc.**De-queues:** Introduction to De-queues (double-ended queues), Operations on De-queues and their applications.

Unit 4 Introduction to non-linear Data Structures 9

Trees: Introduction to Trees, Binary Trees, creation of binary tree, Operations on Binary Tree. Introduction to Binary Search Tree, Operations on Binary Search Trees.

Graphs: Defining graph, basic terminology, graph representation.

Unit 5 Hashing 9

Hashing: Brief introduction to hashing and hash functions, Collision resolution techniques: chaining and open addressing, **Hash tables**: basic implementation and operations, Applications of hashing in unique identifier generation, caching, etc.

Prescribed Textbooks:

1. Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition
2. Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, Silicon Press, 2008

Reference Books:

1. Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders
2. C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft
3. Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum
4. Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein.
5. Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms, Robert Sedge wick

CO-PO Mapping:

Course outcomes	Engineering Knowledge	Problem Analysis	Design/Development t of solutions	Conduct investigations of Complex Problems	Engineering tools usage	The Engineer and World	Ethics	Individual and collaborative teamwork	Communication	Project Ma engagement and Finance	Life-long Learning
24ACSE21T.1	3	2	1	2	2	-	-	-	-	-	3
24ACSE21T.2	3	2	1	2	2	-	-	-	-	-	3
24ACSE21T.3	3	3	3	3	2	-	-	-	-	-	3
24ACSE21T.4	3	3	3	3	2	-	-	-	-	-	3
24ACSE21T.5	3	3	3	3	2	-	-	-	-	-	3

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	**The Joy of Computing Using Python**	
Category:	ES	
Semester:	II Semester	
Course Code:	24ACSE22T	
Branch/es:	ME, CSE, AI&DS, AIML, CSE(ICB), CSE(AI), CSE(DS) & CSE(AIML)	

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:

1. To learn basics of computational problem solving, python programming and basic control structures.
2. To understand python programming basic constructs like lists, dictionaries, sets and functions.
3. To apply module design and usage of text files in python programming.

Course Outcomes:

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

1. Interpret computational problem solving and basic elements of python programming.
2. Analyze python programming basics like lists, tuple, dictionaries, and sets.
3. Demonstrate functions in python programming.
4. Evaluate string processing applications and exception handling in python programming.
5. Develop programs using class and object in python programming.

Unit 1 Introduction to python programming language

Introduction to python programming language, literals, variables and identifiers, operators, expressions and data types. Control Structures: Boolean expressions, selection control, and iterative control.

Unit 2 Lists

Lists: List structures, lists in python, iterating over lists in python, more on python lists. Dictionaries and sets, tuple.

Unit 3 Functions

Functions: Program routines, more on functions, Module Design: Modules, Top-Down design, python modules.

Unit 4 Text Files

Text Files: Text File, Using Text files, string processing, exception handling.

Unit 5 Introduction to object-oriented programming

Introduction to Object oriented programming: class, three fundamental features of object-oriented programming, encapsulation-what is encapsulation, defining classes in python. Inheritance: subtypes, defining subclasses in python, Polymorphism: use of polymorphism.

Prescribed Textbooks:

1. Introduction to Computer Science Using Python: A Computational Problem-Solving Focus, Charles Dierbach.

Reference Books:

1. Python Programming using problem solving approach, ReemaThareja, Oxford University press.
2. Python Programming: An Introduction to Computer Science, John Zelle, Franklin,Beedle & Associates Inc.,3rd Edition.
3. Think Python: How to think like a computer Scientist, Allen Downey 2nd Edition O'Reilly Publications.

CO-PO Mapping:

Course outcomes	Engineering Knowledge	Problem Analysis	Design/Development t of solutions	Conduct investigations of Complex Problems	Engineering tools usage	The Engineer and World	Ethics	Individual and collaborative teamwork	Communication	Project Ma engagement and Finance	Life-long Learning
24ACSE22T.1	3	2	1	2	-	-	-	-	-	-	3
24ACSE22T.2	3	3	2	2	-	-	-	-	-	-	3
24ACSE22T.3	3	2	1	2	-	-	-	-	-	-	3
24ACSE22T.4	3	3	2	3	-	-	-	-	-	-	3
24ACSE22T.5	3	3	3	3	-	-	-	-	-	-	3

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	**Engineering Drawing**	
Category:	ES	
Semester:	I Semester	II Semester
Course Code:	24AMEC11T	24AMEC21T
Branch/es:	CE, ME, EEE, ECE, CSE(AI), AI&DS & CSE(ICB)	CSE, CSE-DS, CSE(AIML) & AI&ML

Lecture Hours	Tutorial Hours	Practice Hours	Credits
1	-	4	3

Course Objectives:

1. To enable the students with various concepts like dimensioning, conventions and standards related to Engineering Drawing.
2. To impart knowledge on the projection of points, lines and plane surfaces.
3. To improve visualization skills for better understanding of projection of solids.
4. To develop the imaginative skills of the students required to understand Section of solids and Developments of surfaces.
5. To make the students understand the viewing perception of a solid object in Isometric and Perspective projections.

Course Outcomes:

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

1. Apply the appropriate annotations and geometric techniques to draw the conic sections, cycloidal curves and involutes
2. Apply the principles of orthographic projection for engineering problems involving inclined lines to create drawings that represent real-world objects.
3. Apply the principles of orthographic projection for solving engineering problems of planes with respect to both reference planes.
4. Apply the principles of orthographic projection for solving engineering problems of solids.
5. Apply the conversion techniques to solve problems related to orthographic projections and isometric projection views.

Unit 1 **5**

Introduction: Lines, Lettering and Dimensioning, Geometrical Constructions and Constructing regular polygons by general method.

Engineering Curves: Construction of Ellipse, Parabola and Hyperbola by General Method - Normal and tangent Cycloid & Epicycloid curves (basic problem) - Normal and tangent Involute of Square, Pentagon - Normal and tangent

Unit 2 3

Orthographic Projections: Reference plane, importance of reference lines or Planes, Projections of a point situated in any one of the four quadrants.

Projections of Straight Lines: Projections of straight lines parallel to both reference planes, perpendicular to one reference plane and parallel to other reference plane, inclined to one reference plane and parallel to the other reference plane, Projections of Straight Line Inclined to both the reference planes.

Unit 3 **5**

Projections of Planes (Square, Circle, Pentagon, Hexagon): A Plane perpendicular to one reference plane and parallel to other, A plane Perpendicular to both reference planes, A plane perpendicular to one reference plane and inclined to the other, A plane inclined to both the reference planes.

Unit 4 **5**

Projections of Solids: Projections of solids (Prism, Pyramid, Cylinder and Cone): Axis perpendicular to Horizontal reference plane and parallel to other, Axis inclined to Horizontal reference plane and parallel to another plane.

Development of Surfaces: Simple Developments of a prism, cylinder, Pyramid and Cone

Unit 5 **5**

Isometric Projections / Conversions: Principles of Isometric Projection – Isometric Scale – Isometric Views of Lines, Planes, Conversion of orthographic views to isometric views (simple problems) and Conversion of isometric views to orthographic views (simple problems)

Prescribed Textbooks:

1. N. D. Bhatt, Engineering Drawing, Charotar Publishing House
2. Engineering Drawing, K.L. Narayana and P. Kannaiah, Tata McGraw Hill

Reference Books:

5. Engineering Drawing, M.B.Shah and B.C. Rana, Pearson Education Inc
6. Engineering Drawing with an Introduction to AutoCAD, Dhananjay Jolhe, Tata McGraw Hill

CO-PO Mapping:

Course outcomes	Engineering Knowledge	Problem Analysis	Design/Development t of solutions	Conduct investigations of Complex Problems	Engineering tools usage	The Engineer and World	Ethics	Individual and collaborative teamwork	Communication	Project Ma engagement and Finance	Life-long Learning
24AMEC11T/21T.1	3	2	1	2	-	-	1	-	1	-	1
24AMEC11T/21T.2	3	2	1	2	-	-	1	-	1	-	1
24AMEC11T/21T.3	3	2	1	2	-	-	1	-	1	-	1
24AMEC11T/21T.4	3	2	1	2	-	-	1	-	1	-	1
24AMEC11T/21T.5	3	2	1	2	2	-	1	-	1	-	1

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	**Chemistry Lab**	
Category:	BS	
Semester:	I Semester	II Semester
Course Code:	24AMEC11L	24AMEC21L
Branch/es:	CE, ME, EEE, ECE, CSE(AI), AI&DS & CSE(ICB)	CSE, CSE-DS, CSE(AIML) & AI&ML

Lecture Hours	Tutorial Hours	Practice Hours	Credits
1	-	4	3

Course Objectives: The course aims to equip students with practical skills in Conductometry, Potentiometry, and Colorimetry for precise chemical analysis. It also provides hands-on experience in synthesizing polymers and nanomaterials, emphasizing their industrial relevance. Additionally, students are trained in separation techniques and UV-Visible spectroscopy for material identification, while enhancing their ability to perform quantitative chemical analyses, such as metal estimation and battery acid strength determination.

Course Outcomes:

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

1. Determine the strength of an acid present in secondary batteries.
2. Calculate the cell constant and conductance of solutions.
3. Estimate metal ions by using various analytical techniques.
4. Analyse the separation methods used for various organic compounds.
5. Synthesize nanomaterials and polymers.

List of experiments

1. Conductometric titration of strong acid vs. strong base.
2. Determination of cell constant and conductance of solutions.
3. Potentiometry - determination of redox potentials and emfs.
4. Determination of strength of an acid in Pb-acid battery.
5. Preparation of Poly Methyl Methacrylate (PMMA).
6. Preparation of Poly Glycidyl Methacrylate (PGMA).
7. Determination of chromium (VI) in potassium dichromate by Colorimetry.
8. Estimation of Zinc by EDTA titration.
9. Preparation of nanomaterials by precipitation method.
10. Identification of simple organic compounds by IR spectroscopy.
11. Estimation of Ferrous Iron by Dichrometry.
12. Wavelength measurement of sample through UV-Visible Spectroscopy.

Prescribed Textbooks:

1. Mendham, J., Denney, R. C., Barnes, J. D., and Sivasankar, B. Vogel's Quantitative Chemical Analysis. 6th ed., Pearson Publications, 2009.
2. Anand, Amirtha, and Kumari, Ramesh. Physical Chemistry Laboratory Manual: An Interdisciplinary Approach. Dreamtech Press, 2020.

CO-PO Mapping:

Course outcomes	Engineering Knowledge	Problem Analysis	Design/Development t of solutions	Conduct investigations of Complex Problems	Engineering tools usage	The Engineer and World	Ethics	Individual and collaborative teamwork	Communication	Project Ma engagement and Finance	Life-long Learning
24ACHE11L/21L.5	2	2	-	1	1	-	-	1	-	-	3
24ACHE11L/21L.5	2	2	-	1	1	-	-	1	-	-	3
24ACHE11L/21L.5	3	2	-	2	1	-	-	1	-	-	3
24ACHE11L/21L.5	3	3	-	2	1	-	-	1	-	-	3
24ACHE11L/21L.5	3	3	-	2	1	-	-	1	-	-	3

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
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RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	**Basic Electrical and Electronics Engineering Lab**	
Category:	BS	
Semester:	I Semester	II Semester
Course Code:	24AEEE11L	24AEEE21L
Branch/es:	CE, ME, EEE, ECE, CSE(AI), AI&DS & CSE(ICB)	CSE, CSE(DS), CSE(AIML) & AI&ML

Lecture Hours	Tutorial Hours	Practice Hours	Credits
-	-	2	1

Course Objectives:

1. To identify the various electrical and electronic components and devices.
2. To impart knowledge and practical exposure on various elements of electrical circuits, operational aspects of various electrical machines and electronic circuits.
3. To analyze the performance of rectifier circuits in practical approach.
4. To observe the characteristics of semiconductor devices.

Course Outcomes:

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

1. Identify the various electrical and electronic components and devices.
2. Analyze various characteristics of electrical circuits, electrical machines and measuring instruments.
3. Analyze the characteristics of various semiconductor devices through practical investigations.
4. Comprehend the usage of electronic devices as half wave and full wave rectifier.

List of experiments

1. Identification, Specifications, Testing of R, L, C Components (Color Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCBs, Diodes, BJT)
2. Study and operation of
   - Multi-meters (Analog and Digital)
   - Function Generator
   - Regulated Power Supplies
   - CRO
3. Verification of KCL and KVL
4. Measurement of resistance by using Ammeter and Voltmeter method
5. Measurement of Earth Resistance using Megger
6. Magnetization Characteristics of DC shunt Generator
7. Brake Test on DC Shunt Motor
8. OC and SC Test on Single Phase Transformer
9. Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias
10. Plot V – I characteristics of Zener Diode
11. Determination of Ripple Factor and Regulation of Half Wave Rectifier with and without capacitive filter
12. Determination of Ripple Factor and Regulation of Full Wave Rectifier with and without capacitive filter
13. Study of Cathode Ray Oscilloscope. (CRO)

Prescribed Textbooks:

1. A.Sudhakar and Shyammohan S Palli, “Circuits and Networks” McGraw Hill, 2018.
2. A.Chakrabarti,” Circuit Theory-Analysis and Synthesis”, Dhanpat Rai &Co,2010.
3. S.Salivahanan, N.Suresh Kumar, “Electronic Devices and Circuits” McGraw Hill, 2011

CO-PO Mapping:

Course outcomes	Engineering Knowledge	Problem Analysis	Design/Development t of solutions	Conduct investigations of Complex Problems	Engineering tools usage	The Engineer and World	Ethics	Individual and collaborative teamwork	Communication	Project Ma engagement and Finance	Life-long Learning
24AEEE11L/21L.1	1	1	1	1	-	-	-	-	-	-	1
24AEEE11L/21L.2	3	3	2	2	-	-	-	-	-	-	1
24AEEE11L/21L.3	3	3	1	1	-	-	-	-	-	-	1
24AEEE11L/21L.4	2	2	1	1	-	-	-	-	-	-	1

ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course: **Data Structures Lab**
Category: ES
Semester: II Semester
Course Code: 24ACSE21L
Branch/es: CSE, AI&DS, AIML, CSE(ICB), CSE(AI), CSE(DS), CSE(AIML)

Lecture Hours	Tutorial Hours	Practice Hours	Credits
-	-	2	1

Course Objectives: The course aims to strengthen the ability of the students to identify and apply suitable data structure for the given real-world problem. It enables them to gain knowledge in practical applications of data structures.

Course Outcomes:
At the end of the course, the student will be able to
1. Interpret the role of linear data structures in organizing and accessing data efficiently
2. Apply linked lists for dynamic data storage and understanding of memory allocation.
3. Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems.
4. Analyze queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between de-queues and priority queues and apply them appropriately to solve data management challenges.
5. Recognize scenarios where hashing is advantageous, and design hash-based solutions for specific problems.

PART-A

WEEK 1: Linked List Implementation
- i) Implement a singly linked list to perform all of its operations.

WEEK 2: Double Linked List Implementation
- i) Implement a doubly linked list and perform all of its operations.
- ii) Implement a circular linked list and perform insertion, deletion, and traversal

WEEK 3: Stacks, Queues and De-queues
- i) Implement a stack using arrays and linked lists.
- ii) Implement a queue using arrays and linked lists.

WEEK 4: Stacks Applications
- i) Write a program to evaluate a postfix expression using a stack.
- ii) Use a stack to evaluate an infix expression and convert it to postfix.
- iii) Implement a program to check for balanced parentheses using a stack.

WEEK 5: Binary Search Tree Implementation

i) Implementing BST operations using Linked List.

WEEK 6: Binary Search Tree Traversing

i) Traversing of BST.

WEEK 7: Implementation of Hashing

i) Implement a hash table with collision resolution techniques

PART-B

WEEK 1: Python Basics, Conditions and Loops

i) Write a Python Program to check if a number is a prime number.
ii) Write a python program to generate the Fibonacci sequence up to a given number of terms.
iii) Write a python program to find the largest prime factor of a given number.

WEEK 2: Python Lists, Dictionaries, and Tuples

i) Write a Python Program to manage a To-Do List.
ii) Write a Python Program to create Contact Book Using Dictionaries.
iii) Write a Python Program to demonstrate Tuples.

WEEK 3: Python Functions and Files

i) Write a Python Function for finding Prime Numbers in a range.
ii) Write a Python function to perform matrix multiplication.
iii) Write a Python Program to read and Print File Contents.
iv) Write a Python Program to write a user input to a file.
v) Write a Python Program to append a user input to a file.

WEEK 4: Single Linked List and Double Linked List Implementation

i) Implement a singly linked list to perform all of its operations.
ii) Implement a doubly linked list and perform all of its operations.

WEEK 5: Stacks, and Queues

i) Implement a stack using arrays and linked lists.
ii) Implement a queue using arrays and linked lists.

WEEK 6: Binary Search Tree Implementation

i) Implementing a BST operations using Linked List.

WEEK 7: Binary Search Tree Traversing

i) Traversing of BST.

Prescribed Textbooks:

1. Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition
2. Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, Silicon Press, 2008
3. Introduction to Computer Science Using Python: A Computational Problem-Solving Focus, Charles Dierbach

CO-PO Mapping:

Course outcomes	Engineering Knowledge	Problem Analysis	Design/Development t of solutions	Conduct investigations of Complex Problems	Engineering tools usage	The Engineer and World	Ethics	Individual and collaborative teamwork	Communication	Project Ma engagement and Finance	Life-long Learning
24ACSE21L.1	3	2	1	2	2	-	-	-		-	-
24ACSE21L.2	3	2	1	2	2	-	-	-		-	-
24ACSE21L.3	3	3	3	3	2	-	-	-		-	-
24ACSE21L.4	3	3	3	3	2	-	-	-		-	-
24ACSE21L.5	3	3	3	3	2	-	-	-		-	-