GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY

Unit of USHODAYA EDUCATIONAL SOCIETY

An ISO 9001:2015 certified Institution: Recognized under Sec. 2(f)& 12(B) of UGC Act, 1956

3rd Mile, Bombay Highway, Gangavaram (V), Kovur(M), SPSR Nellore (Dt), Andhra Pradesh, India- 524137

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Semester-2 (Theory-5, Lab-3)							
Sl. No.	**Category**	**Course Code**	**Course Title**	**Hours per week**			**Credits**
				L	**T**	**P**	**C**
1	BSC	22A0002T	Differential Equations & Vector Calculus	3	0	0	3
2	BSC	22A0005T	Applied Physics in Science and Engineering	3	0	0	3
3	HSC	22A0013T	Communicative English	3	0	0	3
4	ESC	22A0302T	Engineering Drawing	3	0	0	3
5	ESC(LAB)	22A0504T	Data Structures	0	0	3	3
6	BSC (LAB)	22A0010P	Applied Physics in Science and Engineering Lab	0	0	3	1.5
7	HSC(LAB)	22A0014P	Communicative English Lab	0	0	3	1.5
8	ESC(LAB)	22A0505P	Data Structures Lab	0	0	3	1.5
				Total credits			**19.5**

Category	**Credits**
Basic Science Course (BSC)	7.5
Engineering Science Course (ESC)	7.5
Humanities and Social science Course(HSC)	4.5
Total	19.5

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DIFFERENTIAL EQUATIONS & VECTOR CALCULUS

(Common to All Branches)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A0002T	3:0:0:0	3	CIE: 30 SEE:70	3 Hours	BSC

Course Objectives:

This course will enable students to:

- To enlighten the learners in the concept of differential equations and multivariable calculus, to furnish the learners with basic concepts and techniques at plus two level to lead them intoadvanced level by handling various real world applications.

Course Outcomes(CO):

On completion of this course, student will be able to

- Solve the linear differential equations with constant coefficients by appropriate method, classify and interpret the solutions of linear differential equations, formulate and solve the higher order differential equation by analyzing physical situations.
- Apply a range of techniques to find solutions of standard pdes, outline the basic properties of standard PDEs.
- Calcify the PDE, learn the applications of PDEs
- Apply del to Scalar and vector point functions, illustrate the physical interpretation of Gradient, Divergence and Curl.
- Find the work done in moving a particle along the path over a force field, evaluate the rates of fluid flow along and across curves, apply Green's, Stokes and Divergence theorem in evaluation of double and triple integrals.

Syllabus		Total Hours:45
Module-I	**Linear Differential Equations of Higher Order (Constant Coefficients)**	**9Hrs**

Definitions, homogenous and non-homogenous, complimentary function, general solution, particular integral, Wronskean, method of variation of parameters. Simultaneous linear equations, Applications to L-C-R Circuit problems and Mass spring system.

Module-II	**Partial Differential Equations**	**9Hrs**

Introduction and formation of Partial Differential Equations by elimination of arbitrary constants and arbitrary functions, solutions of first order equations using Lagrange's method.

Module-III	**Applications of Partial Differential Equations**	**9Hrs**

Classification of PDE, method of separation of variables for second order equations. Applications of Partial Differential Equations: One dimensional Wave equation, One dimensional Heat equation.

Module-IV	**Vector Differentiation**	**9Hrs**

Scalar and vector point functions, vector operator del, del applies to scalar point functions- Gradient, del applied to vector point functions-Divergence and Curl, vector identities.

Module-V	**Vector Integration**	**9Hrs**

Line integral-circulation-work done, surface integral-flux, Green's theorem in the plane (without proof), Stoke's theorem (without proof), volume integral, Divergence theorem (without proof) and applications of these theorems.

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, 44/e, Khanna publishers, 2017.
2. 2. Differential Equations & Vector Calculus by T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N.Prasad S. Chand publication

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.
2. B.V.Ramana, "Higher Engineering Mathematics", Mc Graw Hill publishers.
3. Engineering Mathmatic I & II, by T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N.Prasad S. Chand publication..

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APPLIED PHYSICS IN SCIENCE AND ENGINEERING
(Common to CSE,AIML,DS,CS)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A0005T	3:0:0:0	3	CIE: 30 SEE:70	3 Hours	BSC

Course Objectives:

This course will enable students to:

- To make a bridge between the physics in school and engineering courses.
- To impart the knowledge in basic concepts of the optical phenomenon like interference, diffraction and polarization.
- To understand the mechanisms of emission of light, the use of lasers as light sourcesfor low and high energy applications, study of propagation of light wave through optical fibers along with engineering applications.
- To open new avenues of knowledge and understanding the basic concepts of dielectric and magnetic materials and its application in the emerging micro devices.
- Evolution of band theory to distinguish materials, basic concepts and transport phenomenon of charge carriers in semiconductors.
- To identify the importance of semiconductors in the functioning of electronic devices.
- To teach the concepts related to superconductivity which leads to their fascinating applications.
- To familiarize the students with smart material applications relevant to engineering branches.

Course Outcomes(CO):

On completion of this course, student will be able to

- Describe the importance of Interference, Diffraction and Polarization and the engineering applications as well (L2)
- Demonstrate the properties of lasers and fibre optics to various applications in science and technology (L2)
- Explain the fundamental concepts and theory related to dielectric and magnetic materials (L1)
- Illustrate the functioning of semiconductors in electronic devices (L2)
- Discuss the principles and theory related to superconductors and explore their technological applications(L2)
- Illustrate diverse principles and theories of nano and smart materials and their technological applications in diverse fields (L2)

Syllabus		Total Hours:48
Module-I	**Wave Optics**	**10Hrs**

Interference- Principle of superposition – Interference of light – Types of Interference – Path difference – Phase difference – Conditions for sustained interference- Interference in thin films (Reflection Geometry) – Colors in thin films – Newton's Rings –Determination of wavelength and refractive index of liquid.

Diffraction- Introduction – Fresnel and Fraunhofer diffraction – Fraunhofer diffraction due to singleslit, double slit and N-slits (qualitative) – Grating spectrum**.**

Polarization- Introduction – Types of polarization – Polarization by reflection, refraction and double refraction - Nicol's Prism - Half wave and Quarter wave plates with applications

Module-II	Lasers and Fiber optics	10Hrs

Lasers- Introduction – Characteristics of laser – Spontaneous and Stimulated emission of radiation – Einstein's coefficients – Population inversion – Lasing action – Pumping mechanisms – Ruby laser – He-Ne laser – Applications of lasers.

Fiber optics- Introduction – Principle of optical fiber – Acceptance Angle – Numerical Aperture – Classification of optical fibers based on refractive index profile and modes – Propagation of electromagnetic wave through optical fibers – Propagation Losses (qualitative) – Applications

Module-III	Dielectric and Magnetic Materials	10Hrs

Dielectric Materials- Introduction – Dielectric polarization – Dielectric polarizability, Susceptibility and Dielectric constant – Types of polarizations: Electronic, Ionic and Orientation polarizations (Qualitative) – Lorentz internal field – Clausius-Mossotti equation.

Magnetic Materials- Introduction –Basic definitions – Origin of permanent magnetic moment – Classification of magnetic materials: Dia, para & Ferro – Hysteresis – Soft and Hard magnetic materials

Module-IV	Semiconductors and Superconductors	10Hrs

Semiconductors- Introduction – Classification of crystalline solids – Intrinsic semiconductors – Extrinsic semiconductors – Density of charge carriers — Drift and diffusion currents – Einstein's equation – Formation of p-n junction diode – Direct and indirect band gap semiconductors – Hall effect – Hall coefficient – Applicationsof Hall effect.

Superconductors- Introduction – Properties of superconductors – Meissner effect – Type I and Type II superconductors – BCS theory – Josephson effects (AC and DC) – High T_c superconductors – Applications of superconductors.

Module-V	New Engineering Materials	8Hrs

Nanomaterials- Introduction – Surface area and quantum confinement –Properties of Nanomaterials – Synthesis of nanomaterials: Top-down: Ball Milling – Bottom-up: Chemical Vapour Deposition – Applications of nanomaterials.

Smart Materials: Introduction- Smart Memory alloys (SMA), photovoltaics (PV) (properties and applications)

Text Books:

1. Engineering Physics – Dr. M.N. Avadhanulu & Dr. P.G. Kshirsagar, S. Chand and Company
2. Engineering Physics – B.K. Pandey and S. Chaturvedi, Cengage Learning.
3. Applied Physics for Engineers- K.Venkataramanan, R. Raja, M. Sundararajan(Scitech) [3,5] 2014

Reference Books:

1. Engineering Physics – Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018
2. Engineering Physics – K. Thyagarajan, McGraw Hill Publishers
3. Engineering Physics - Sanjay D. Jain, D. Sahasrambudhe and Girish, University Press
4. Semiconductor physics and devices- Basic principle – Donald A, Neamen, Mc Graw Hill
5. T Pradeep "A Text book of Nano Science and Nano Technology"- Tata Mc GrawHill 2013

E-resources:

- https://www.textbooks.com/Catalog/MG5/Applied-Physics.php
- https://edurev.in/courses/9596_Electromagnetic-Theory-Notes--Videos--MCQs--PPTs
- https://libguides.ntu.edu.sg/c.php?g=867756&p=6226561
- https://bookauthority.org/books/best-applied-physics-books
- https://www.electronicsforu.com/resources/16-free-ebooks-on-material-science/2

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COMMUNICATIVE ENGLISH

(Common to All Branches)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A0013T	3:0:0:0	3	CIE: 30 SEE:70	3 Hours	HSC

Course Objectives:

- Facilitate effective listening skills for better comprehension of academic lectures and English spoken by native speakers
- Focus on appropriate reading strategies for comprehension of various academic texts and authentic materials
- Help improve speaking skills motivating the learners to participate in activities such as role plays, discussions and structured talks/oral presentations
- Impart effective strategies for good writing and enhancing skills in summarizing, writing well organized essays, drafting formal letters and designing well structured reports
- Broaden the knowledge base of grammatical structures and vocabulary and encourage their appropriate use in speech and writing

Course Outcomes(CO):

On completion of this course, student will be able to

- Retrieve the knowledge of basic grammatical concepts
- Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English
- Apply grammatical structures to formulate sentences and correct word forms
- Analyze discourse markers to speak clearly on a specific topic in informal discussions
- Evaluate reading/listening texts and to write summaries based on global comprehension of these texts.
- Create a coherent paragraph interpreting a figure/graph/chart/table.

Syllabus		Total Hours:45
Module-I	**On the Conduct of Life: William Hazlitt**	**9Hrs**

Listening: Identifying the topic, the context and specific pieces of information by listening to short audio texts and answering a series of questions.

Speaking: Asking and answering general questions on familiar topics such as home, family, work, studies and interests; introducing oneself and others.

Reading: Skimming to get the main idea of a text; scanning to look for specific pieces of information.

Reading for Writing: Beginnings and endings of paragraphs - introducing the topic, summarizing the main idea and/or providing a transition to the next paragraph.

Grammar and Vocabulary: Parts of Speech,
Content words and function words;
Word order in sentences;
Basic sentence structures;
Types of questions - Wh- questions.

Module-II	**The Brook: Alfred Tennyson**	**9Hrs**

Listening: Answering a series of questions about main idea and supporting ideas after listening to audio texts.

Speaking: Discussion in pairs/small groups on specific topics followed by short structured talks**.**

Reading: Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in a paragraph together.

Writing: Paragraph writing (specific topics) using suitable cohesive devices; mechanics of writing - punctuation, capital letters.

Grammar and Vocabulary: Cohesive devices - linkers
Use of articles and zero article
Prepositions
Punctuation, capital letters

Module-III	The Death Trap: Saki	11Hrs

Listening: Listening for global comprehension and summarizing what is listened to.
Speaking: Discussing specific topics in pairs or small groups and reporting what is discussed
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, Paragraph Writing
Grammar and Vocabulary: Verbs - tenses
Subject-verb agreement
Direct & Indirect speech

Module-IV	Innovation: Muhammad Yunus	10Hrs

Listening: Making predictions while listening to conversations/ transactional dialogues without video; listening with video.
Speaking: Role plays for practice of conversational English in academic contexts (formal and informal) - asking for and giving information/directions.
Reading: Studying the use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicate processes or display complicated data.
Writing: Letter Writing: Official Letters/Report Writing
Grammar and Vocabulary: Adjectives and adverbs; comparing and contrasting
Voice - Active & Passive Voice.

Module-V	An Astrologer's Day: R. K. Narayan	8Hrs

Listening: Identifying key terms, understanding concepts and answering a series of relevant questions that test comprehension.
Speaking: Formal oral presentations on topics from academic contexts- without the use of PPT slides.
Reading: Reading for comprehension.
Writing: Writing structured essays on specific topics using suitable claims and evidences.
Grammar and Vocabulary: Identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject verb agreement)

Text Books:

1. Language and Life: English Skills for Engineering Students - Orient Black Swan

Reference Books:

1. Bailey, Stephen. Academic writing: A handbook for international students. Routledge, 2014.
2. Chase, Becky Tarver. Pathways: Listening, Speaking and Critical Thinking. Heinley ELT; 2nd Edition, 2018.
3. Raymond Murphy's English Grammar in Use Fourth Edition (2012) E-book
4. Hewings, Martin. Cambridge Academic English (B2). CUP, 2012.
5. Oxford Learners Dictionary, 12th Edition, 2011
6. Norman Lewis Word Power Made Easy- The Complete Handbook for Building a Superior Vocabulary (2014)

Web links:

1. www.englishclub.com
2. www.easyworldofenglish.com
3. www.languageguide.org/english/
4. www.bbc.co.uk/learningenglish
5. www.eslpod.com/index.html

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ENGINEERING DRAWING

(Common to All Branches)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A0302T	3:0:0:0	3	CIE: 30 SEE:70	3 Hours	ESC

Course Objectives:

- Bring awareness that Engineering Drawing is the Language of Engineers.
- Familiarize how industry communicates technical information.
- Teach the practices for accuracy and clarity in presenting the technical information.
- Develop the engineering imagination essential for successful design.

Course Outcomes(CO):

On completion of this course, student will be able to

- Draw various curves applied in engineering. (l2)
- Show projections of solids and sections graphically. (l2)
- Draw the development of surfaces of solids. (l3)

Syllabus		Total Hours:45
Module-I	**Introduction to Engineering Drawing**	**10Hrs**

Introduction to Engineering Drawing: Principles of Engineering Drawing and its significance-Conventions in drawing-lettering - BIS conventions.

a) Draw the Conic sections including Ellipse, Parabola, Hyperbola, and the Rectangular hyperbola using general methods,

b) Draw the Cycloid, Epicycloids, and Hypocycloid

c) Draw the Involutes of circle, square, pentagon, and hexagon

Module-II	Projections of points, lines and planes	10Hrs

Projections of points, lines, and planes: Projection of points in any quadrant, lines inclined to one and both planes, finding true lengths, finding true inclinations, angle made by line. Projections of regular plane surfaces using rotating plane method

Module-III	Projections of solids	10Hrs

Projections of solids: Projections of regular solids inclined to one and boththe principle planes using auxiliary views method..

Module-IV	Sections of solids	10Hrs

Sections of solids: Section planes and sectional view of right regular solids- prism, cylinder, pyramid and cone. True shapes of the sections..

Module-V	Development of surfaces	10Hrs

Development of surfaces: Development of surfaces of right regular solids-prism, cylinder, pyramid, cone and their sectional parts..

Text Books:

1. K.L.Narayana&P.Kannaiah, Engineering Drawing, 3/e, Scitech Publishers, Chennai, 2012.
2. N.D.Bhatt, Engineering Drawing, 53/e, Charotar Publishers, 2016.

Reference Books:

1. Dhanajay A Jolhe, Engineering Drawing, Tata McGraw-Hill, Copy Right, 2009
2. Venugopal, Engineering Drawing and Graphics, 3/e, New Age Publishers, 2000
3. Shah and Rana, Engineering Drawing, 2/e, Pearson Education, 2009
4. K.C.John, Engineering Graphics, 2/e, PHI, 2013
5. Basant Agarwal &C.M.Agarwal, Engineering Drawing, Tata McGraw-Hill, Copy Right, 2008.

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DATA STRUCTURES

(Common to All Branches)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A0504T	3:0:0:0	3	CIE: 30 SEE:70	3 Hours	ESC

Course Objectives:

- Introduce the fundamental concept of data structures and Arrays
- Emphasize the importance of data structures in developing and implementing efficient algorithms
- Introduces a variety of data structures such as linked structures, stacks, queues, trees, and graphs

Course Outcomes(CO):

On completion of this course, student will be able to

- CO1: Ability to select the data structures that efficiently model the information in a problem
- CO2: Discuss the computational efficiency of the principal algorithms for sorting & searching
- CO3: Implement basic operations on stack and queue using array representation.
- CO4: Use linked structures, trees, and Graphs in writing programs
- CO5: Demonstrate different methods for traversing Graphs and Trees

Syllabus		Total Hours:45
Module-I	**Introduction**	**10Hrs**

Introduction to Data Structures: Definitions, Concept of Data Structures, Overview of Data Structures, Implementation of Data Structures

Arrays: Definition, terminology, One Dimensional array, multi-Dimensional arrays, Pointer Arrays, Linear Search, Binary Search

Module-II	Linked Lists	9Hrs

Linked Lists: Definition, Single Linked List, Circular Linked List, Double Linked List, Circular Double Linked List, Applications of Linked List

Module-III	Stacks and Queues	10Hrs

Stacks: Introduction, Definition, Representation of Stack, Operations on Stacks, Applications of stack: Expression Evaluation, Conversion of Infix to postfix and prefix expression, Tower of Hanoi

Queues: Introduction, Definition, Representation of Queues, Operations on Queues, Various Queue Structures, Applications of Queues

Module-IV	Trees	10Hrs

Trees: Basic Terminologies, Definition and Concepts, Binary Tree, Representation of Binary Tree, Operations on Binary Tree, Binary Search Tree, Operations in BST: insertion, deletion, finding min and max, finding the kth minimum element. Heap Tree, Height Balanced Binary Tree, Red-Black Tree, Splay Tree, B Trees, B+ Trees.

Module-V	Graphs and Sorting	9Hrs

Graphs: Introduction, Graph Terminologies, Representation of graphs, Operations on Graphs, Graph Traversal: Breadth First Search (BFS), Depth First Search (DFS)

Sorting: Insertion sort, Selection sort, Bubble sort, Counting sort, Quick sort, Merge sort, heap sort

Text Books:

1. Classic Data Structures, Second Edition, Debasissamanta, PHI
2. Fundamentals of Data Structures in C, 2nd Edition, E. Horowitz, S.Sahni and Susan Anderson Freed, Universities Press

Reference Books:

1. Data Structures: A Pseudo code Approach with C, 2nd Edition, R.F.Gilberg and B. A. Forouzan, Cengage Learning.
2. "Data Structures and Algorithm Analysis in C" by Weiss
3. "Data Structure Through C" by Yashavant P Kanetkar
4. "Problem Solving in Data Structures and Algorithms Using C: The Ultimate Guide to Programming Interviews" by Hemant Jain

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APPLIED PHYSICS IN SCIENCE AND ENGINEERING LAB
(Common to CSE,AIML,DS,CS)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A0010P	0:0:3:0	1.5	CIE: 30 SEE:70	3 Hours	BSC

Course Objectives:

- Understands the concepts of interference, diffraction and their applications.
- Understand the role of optical fiber parameters in communication.
- Recognize the importance of energy gap in the study of conductivity and Hall Effect in a semiconductor.
- Illustrates the magnetic and materials applications.
- Apply the principles of semiconductors in various electronic devices

Course Outcomes(CO):

On completion of this course, student will be able to

- Determine the radius of a curvature and / or thickness of thin wire using microscope with the help of interference concept (L2)
- Evaluate the wavelength of various colors of grating and also dispersive power of prism by spectrometer using the principle of diffraction (L2)
- Evaluate wavelength of light source and particle size with He-Ne laser using the principle of diffraction Estimate the numerical aperture of a given optical fiber and hence to find its acceptance angle (L2)
- Estimate the dielectric constant of a given material (L2)
- Examine the hysteresis loss of the magnetic material by B- H curve and Estimate the magnetic field of a circular coil carrying current along the axis (L2)
- Measure the type of conductivity ,hall voltage and hall coefficient of a given semiconductor using hall effect and also measure the energy band gap of a given semiconductor material (L2)

Syllabus | **Total Hours:45**

List of Experiments

1. Determine the thickness of the wire using wedge shape method
2. Determination of the radius of curvature of the lens by Newton's ring method
3. Determination of wavelength by plane diffraction grating method
4. Determination of dispersive power of prism.
5. Determination of wavelength of LASER light using diffraction grating.
6. Determination of particle size using LASER.
7. To determine the numerical aperture of a given optical fiber and hence to find itsacceptance angle
8. Magnetic field along the axis of a circular coil carrying current –Stewart Gee's method.
9. Study the variation of B versus H by magnetizing the magnetic material (B-H curve)
10. To determine the resistivity of semiconductor by Four probe method
11. To determine the energy gap of a semiconductor
12. Determination of Hall voltage and Hall coefficient of a given semiconductor using HallEffect.

Note: In the following list, out of 12 experiments, any 2 experiments must be performed in a virtual mode

Text Books:

1. Engineering Practical Physics B Mallick S Panigrahi, 1st, Edition, Cengage Learning Publishers
2. A Text book of Engineering Physics Practical, Dr. Ruby Das, Dr. Rajesh Kumar, C. S. Robinson, Prashant Kumar Sah, UNIVERSITY SCIENCE PRESS (An Imprint of Laxmi Publications Pvt. Ltd.)

Reference Books:

1. S. Balasubramanian, M.N. Srinivasan "A Text book of Practical Physics"- S ChandPublishers, 2017

E-resources:

1. http://vlab.amrita.edu/index.php -Virtual Labs, Amrita University
2. https://www.scribd.com/doc/81569075/Physics-Lab-Manual
3. http://www.mlritm.ac.in/assets/img/Lab%20manual%20Physics.pdf
4. https://bmsit.ac.in/public/assets/pdf/physics/studymaterial/Physics%20lab%20manual_cbcs%20%20-%20kavichintu.pdf

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COMMUNICATIVE ENGLISH LAB
(Common to All Branches)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A0014P	0:0:3:0	1.5	CIE: 30 SEE:70	3 Hours	HSC

Course Objectives:

This course will enable students to:

- Students will be exposed to a variety of self instructional, learner friendly modes of language learning
- Students will learn better pronunciation through stress, intonation and rhythm
- Students will be trained to use language effectively to face interviews, group discussions, public speaking
- Students will be initiated into greater use of the computer in resume preparation, report writing, format making etc.

Course Outcomes(CO):

On completion of this course, student will be able to

- Listening and repeating the sounds of English Language
- Understand the different aspects of the English language proficiency with emphasis on LSRW skills
- Apply communication skills through various language learning activities
- Analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension.
- Evaluate and exhibit acceptable etiquette essential in social and professional settings
- Create awareness on mother tongue influence and neutralize it in order to Improve fluency in spoken English.

Syllabus	Total Hours:45

1. Phonetics
2. Reading comprehension
3. Describing objects/places/persons
4. Role Play or Conversational Practice
5. JAM
6. Etiquettes of Telephonic Communication
7. E-mail Writing
8. Group Discussions
9. Resume Writing
10. Debates
11. Oral Presentations
12. Interviews Skills

Suggested Software: Walden InfoTech / Young India Films

Reference Books:

1. Bailey, Stephen. Academic writing: A handbook for international students. Routledge, 2014.
2. Chase, Becky Tarver. Pathways: Listening, Speaking and Critical Thinking. Heinley ELT; 2nd Edition, 2018.
3. Skillful Level 2 Reading & Writing Student's Book Pack (B1) Macmillan Educational.
4. Hewings, Martin. Cambridge Academic English (B2). CUP, 2012.
5. 5. A Textbook of English Phonetics for Indian Students by T. Balasubramanyam

E-resources:

1. www.esl-lab.com
2. www.englishmedialab.com
3. www.englishinteractive.net

GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY

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DATA STRUCTURES LAB
(Common to CSE,AIML,DS,CS)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A0505P	0:0:3:0	1.5	CIE: 30 SEE:70	3 Hours	ESC

Course Objectives:

This course will enable students to:

- Exploring basic data structures such as stacks and queues.
- Introduces variety of data structures such as hash linked list, trees and graphs.
- Introduces searching and sorting algorithms

Course Outcomes(CO):

On completion of this course, student will be able to

- CO1: Use basic data structures such as arrays, Stacks and Queues
- CO2: Programs to demonstrate fundamental algorithmic problems including Tree Traversals, Graph traversals
- CO3 Use various searching and sorting algorithms.
- CO4: Use linked structures, trees, and Graphs in writing programs

Syllabus | **Total Hours:45**

List of Experiments

1. Write C program that use both recursive and non-recursive functions to perform Linear search for a key value in a given list.
2. Write C program that use both recursive and non-recursive functions to perform Binary search for a key value in a given list.
3. Write a C program that uses functions to perform the following operations on singly linked list.:
   i) Creation ii) Insertion iii) Deletion iv) Traversal
4. Write a C program that uses functions to perform the following operations on doubly linked list.:
   i) Creation ii) Insertion iii) Deletion iv) Traversal
5. Write a C program that uses functions to perform the following operations on circular linked list.:
   i) Creation ii) Insertion iii) Deletion iv) Traversal
6. Write a C program that implement stack (its operations) using
   i) Arrays ii) Pointers
7. Write a C program that implement Queue (its operations) using
   i) Arrays ii) Pointers
8. Write a C program that Uses Stack Operations to Convert Infix expression into Postfix expression
9. Write a C program that Uses Stack Operations to Evaluate the Postfix expression
10. Write a C program that uses functions to perform the following
    i) creating a binary tree of integers ii) Traversing the above binary tree in preorder, inorder and post order
11. Write a C program that uses functions to perform the following operations on Binary search Tree.:
    i) Creation ii) Insertion iii) Deletion
12. Write a program that implements the following sorting methods to sort a given list of integers in ascending order
    i) Quick sort ii) Merge sort
13. Write a program to implement the graph traversal methods.

Text Books:

1. Classic Data Structures, Second Edition, Debasissamanta, PHI
2. Fundamentals of Data Structures in C, 2nd Edition, E. Horowitz, S.Sahni and Susan Anderson Freed, Universities Press 3. Circuit Theory Analysis & Synthesis A. Chakrabarti, Dhanpat Rai & Sons, 7th Revised Edition, 2018

Reference Books:

1. Data Structures: A Pseudo code Approach with C, 2nd Edition, R.F.Gilberg and B. A. Forouzan, Cengage Learning.
2. "Data Structures and Algorithm Analysis in C" by Weiss
3. "Data Structure Through C" by Yashavant P Kanetkar
4. "Problem Solving in Data Structures and Algorithms Using C: The Ultimate Guide to Programming Interviews" by Hemant Jain