GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY: NELLORE
(AUTONOMOUS)

NELLORE–524317 (A.P) INDIA

B.TECH IN ELECTRONICS & COMMUNICATION ENGINEERING
(ACCREDITATED BY NBA)
COURSE STRUCTURE AND SYLLABI
UNDER RG 22 REGULATIONS

<u>DEPARTMENT VISION</u>

To become a reputed learning centre producing competent professionals.

<u>DEPARTMENT MISSION</u>

DM₁: Provide Quality education through interactive teaching-learning practices.

DM₂: Establish Technology-enabled environment for core competencies including robotics.

DM₃: Arrange Industry-Collaboration to hone professional skills.

DM₄: Organize activities to foster social skills and ethical values.

Program Educational Objectives (PEOs)

PEO1: Professional Skills: Apply Engineering concepts to solve Electronics and Communication Engineering problems of social relevance.

PEO3: Industry Needs: Design and develop Electronic devices and Systems for Industry or pursue research.

PEO2: Lifelong Learning: Demonstrate competencies through continuous learning and adapt to multi-disciplinary environment**.**

PEO4: Engineering citizenship: Practice professional ethics and contribute to the societal needs**.**

Program Outcomes

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes

PSO1   **Professional Skills**: Apply principles of Analog and Digital Electronics, Communication Systems, Image processing, VLSI and Embedded Systems to solve diverse problems.

PSO2   **Software Knowledge**: Develop solutions for complex engineering problems of social relevance by employing Xilinx, CC Studio, Micro Wind, Keil, NG Spice, Scilab tools.

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B.TECH Electronics & Communication Engineering
Course Structure (RG22)

Semester 0

Induction Program: 3weeks
(Common for All Branches of Engineering)

S.No	Course No	Course Name	Category	L-T-P-C
1		Physical Activities -- Sports, Yoga and Meditation, Plantation	MC	0-0-6-0
2		Career Counselling	MC	2-0-2-0
3		Orientation to all branches -- career options,tools, etc.	MC	3-0-0-0
4		Orientation on admitted Branch -- corresponding labs, tools and platforms	EC	2-0-3-0
5		Proficiency Modules & Productivity Tools	ES	2-1-2-0
6		Assessment on basic aptitude andmathematical skills	MC	2-0-3-0
7		Remedial Training in Foundation Courses	MC	2-1-2-0
8		Human Values & Professional Ethics	MC	3-0-0-0
9		Communication Skills -- focus on Listening,Speaking, Reading, Writing skills	BS	2-1-2-0
10		Concepts of Programming	ES	2-0-2-0

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B.TECH Electronics & Communication Engineering
Course Structure (RG22)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	C
1	BSC	22A0001T	Linear Algebra and Calculus	3	0	0	3
2	BSC	22A0003T	Applied Physics	3	0	0	3
3	HSC	22A0013T	Communicative English	3	0	0	3
4	ESC	22A0518T	C Programming & Data Structures	3	0	0	3
5	ESC	22A0302T	Engineering Drawing	1	0	4	3
6	HSC (Lab)	22A0014P	Communicative English Lab	0	0	3	1.5
7	BSC (Lab)	22A0008P	Applied Physics Lab	0	0	3	1.5
8	ESC (Lab)	22A0519P	C Programming & Data Structures Lab	0	0	3	1.5
			Total credits				19.5

Semester - 1 (Theory-5, Lab-3)

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

LINEAR ALGEBRA & CALCULUS					
Course Code	**L:T:P:C**	**Credits**	**Exam Marks**	**Exam Duration**	**Course Type**
22A0001T	**3: 0:0:0**	**3**	**CIE: 30 SEE:70**	**3Hours**	**BS**

Course Objectives:

This course will illuminate the students in the concepts of calculus and linear algebra. To equip the students with standard concepts and tools at an intermediate to advanced level mathematics to develop the confidence and ability among the students to handle various real world problems and their applications.

Syllabus	Total Hours: 45

Module - I	Matrices	9 Hrs

Rank of a matrix by echelon form, normal form. Solving system of homogeneous and non-homogeneous equations linear equations. Applications: Finding the current in electrical circuits Eigen values and Eigenvectors and their properties, Cayley- Hamilton theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton theorem, diagonalisation of amatrix.

Module - II	Mean Value Theorems	9 Hrs

Rolle's Theorem (Without Proof), Lagrange's mean value theorem (Without Proof), Cauchy's mean value theorem (Without Proof), related problems, Taylor's and Maclaurin theorems with remainders (without proof) - related problems, Taylor's and Maclaurin series (without proof) Expansions of functions by Taylors and Maclaurin's series.

Module - III	Multivariable Calculus	9 Hrs

Partial derivatives, total derivatives, chain rule, change of variables, Jacobians, maxima and minima of functions of two variables, method of Lagrange multipliers.

Module - IV	Multiple Integrals	9 Hrs

Double integrals, change of order of integration, change of variables. Evaluation of triple integrals, change of variables between Cartesian, cylindrical and spherical polar co-ordinates. Finding areas and volumes using double and triple integrals.

Module - V	Beta and Gamma functions	9 Hrs

Beta and Gamma functions and their properties, relation between beta and gamma functions,evaluation of definite integrals using beta and gamma functions.

Course Outcomes (CO):

On completion of this course, student will be able to
- Solving the system of linear equations, find the eigen values and eigenvectors and use thisinformation to facilitate the calculation of matrix characteristics.
- Translate the given function as series of Taylor's and Maclaurin's with remainders, analyzethe behavior of functions by using mean value theorems.
- Acquire the Knowledge maxima and minima functions of several variables. Utilize Jacobian ofa coordinate transformation to deal with the problems in change of variables.
- Apply multiple integration techniques in evaluating areas and volumes bounded by the region.
- Understand beta and gamma functions and its relations, conclude the use of special function in evaluating definite integrals.

Textbooks:

1. Higher Engineering Mathematics, B. S. Grewal , 44/e, Khanna Publishers, 2017.
2. Linear Algebra & Calculus by T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N.Prasad S. Chand publication.
3. Engineering Mathematics III by N.P. Bali, Dr. K.L. Sai Prasad, University Science Press.

Reference Books:

1. "Advanced Engineering Mathematics", Erwin Kreyszig, Wiley India
2. B.V.Ramana, "Higher Engineering Mathematics", Mc Graw Hill publishers.
3. Mathematical Methods by T.K.V. Iyengar, B.Krishna Gandhi, S. Ranganatham and M.V.S.S.N.Prasad, S. Chand Publications.

Applied Physics (Common to ECE, EEE)					
Course Code	L:T:P:C	Credits	Exam Marks	Exam Duration	Course Type
22A0003T	3:0:0:0	3	CIE:30 SEE:70	3H	BS

Prerequisite: Student should know about fundamental and basic principles in physics.

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 andpolarization.
- To understand the mechanisms of emission of light, the use of lasers as light sources for 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 magneticmaterials and its application in the emerging micro devices.
- Evolution of band theory to distinguish materials, basic concepts and transport phenomenon of chargecarriers in semiconductors.
- To identify the importance of semiconductors in the functioning of electronic devices.
- To enlighten the concepts related to superconductivity which leads to their fascinating applications.
- To impart knowledge in basic concepts of electromagnetic waves

Syllabus	Total Hours: 48
Module - I Wave Optics	10

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	10

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	10

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	10

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

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

Module –V Electrostatics and Electromagnetic Waves	8

Electrostatics -Introduction**-** Electric charge-Coulomb's law**-**Electric filed-- Electric field due to linear charge-Gauss' law- statement and its proof- Derivation of Coulomb's law from Gauss law.

Electromagnetic Waves- Introduction**-**Divergence and Curl of Electric and Magnetic Fields- Stokes' theorem for curl- Maxwell's Equations (Quantitative)- Electromagnetic wave propagation (Non-conducting medium (dielectric medium)) -Poynting's Theorem.

Course Outcomes:

On completion of this course, the students are 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)

- Explain the electromagnetic wave propagation and its power in non-conducting medium (L2)

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. David J.Griffiths, "Introduction to Electrodynamics"- 4/e, Pearson Education,2014

5. Semiconductor physics and devices- Basic principle – Donald A, Neamen, Mc Graw Hill

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

COMMUNICATIVE ENGLISH					
(Common to all Branches of Engineering)					
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**	**HS**

Course Objectives:

- Facilitate effective **listening skills** for better comprehension of academic lectures and English spoken by native speakers
- Help improve **speaking skills** motivating the learners to participate in activities such as role plays, discussions and structured talks/oral presentations
- Focus on appropriate **reading skills** for comprehension of various academic texts and authentic materials
- Impart effective strategies for good **writing 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

Syllabus	Total Hours:48

Module - I	**On the Conduct of Life: William Hazlitt**	**9 Hrs**

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: Use of Articles and zero Article
        Prepositions
        Punctuation, capital letters
        Cohesive devices - linkers

Module - III	**The Death Trap: Saki**	**11 Hrs**

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: Paragraph Writing , Summarizing
Grammar and Vocabulary: Verbs - Tenses
        Subject-Verb agreement
        Direct & Indirect speech

Module - IV	Ponnuthayi – Bama	10 Hrs

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: Read and Interpret graphic Information to 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	My Beloved Charioteer- Shasi Deshpande	9 Hrs

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)

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 listening /reading texts and to write summaries based on global comprehension of these texts.
- Create and develop coherent paragraph interpreting graphical description.

Textbooks:

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

Reference Books:

1. 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:

www.englishclub.com

www.easyworldofenglish.com

www.languageguide.org/english/

www.bbc.co.uk/learningenglish

www.eslpod.com/index.html

C-PROGRAMMING & DATA STRUCTURES

Common to(ECE,EEE,ME,CE)

Course Code	L:T:P:S	Credits	Exam Marks	Exam Duration	Course Type
22A0502T	3: 1:0:0	3	CIE: 30SEE:70	3Hours	ESC

Course Objectives:

This course will enable students to:

- Illustrate the basic concepts of C programming language.
- Choose a suitable C-construct to develop C code for a given problem.
- Illustrate the fundamental concept of data structures and Arrays.
- Emphasize the importance of data structures in developing and implementing efficient. algorithms.
- Illustrate a variety of data structures such as linked structures, stacks, queues, trees, and graphs.

Syllabus		Total Hours:45
Unit - I	**Introduction to C Language**	**9Hrs**

Structure of C program, C Tokens, Data types, Operators, Precedence and Associativity of operators, Expressions and its evaluation, control structures – sequence, selection and Iteration statements, unconditional control structures – break, goto, continue. Arrays: Introduction to arrays, types of arrays, applications of arrays, Programming examples

Unit - II	**Strings, Functions and Pointers**	**9Hrs**

String: Declaring and Initializing string, Printing and reading strings, string manipulation functions, String input and output functions, array of strings, Programming examples

Functions: Defining function, user defined functions, standard functions, passing array as argument to function, recursion

Pointers: declaring and initializing pointers, pointers and arrays, pointer to pointer, pointer arithmetic, dynamic memory allocation,

Structures and Unions

Unit - III	**Data Structures**	**9Hrs**

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

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

Unit - IV	**Stacks & Queues**	**9Hrs**

Stacks: Introduction, Definition, Representation of Stack, Operations on Stacks, Applications of Stacks

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

Unit - V	Trees ,Graphs ,Searching and Sorting	9Hrs

Trees: Basic Terminologies, Definition and Concepts, Binary Tree, Representation of Binary Tree, operations on Binary Tree, Binary Search Tree, Heap Tree

Graphs: Introduction, Graph Terminologies, Representation of graphs, Operations on Graphs, Graph, Graph Traversal Techniques: BFS and DFS

Searching and Sorting – sequential search, binary search, exchange (bubble) sort, selection sort, insertion sort.

Course Outcomes(CO):

On completion of this course, student will be able to

- Illustrate and explain the basic computer concepts and programming principles of C language(L2)
- Select the best selection and loop construct for solving given problem(L2)
- Develop C programs to demonstrate the applications of derived data types such as arrays, pointers, strings.(L2)
- Implement basic operations on stack and queue using array representation(L2)
- Use linked structures, trees, and Graphs in writing programs(L2)
- Demonstrate different methods for traversing Graphs and Trees (L2)

Text Books:
1. C Programming & Data Structures – Behrouz A. Fourazan, Richard F. Gilberg.
2. Programming with C – Byron Gottfried, Third edition, Scham's Outlines
3. C Programming : A Problem Solving Approach- Behrouz A. Fourazan , E.V.Prasad, Richard F. Gilberg
4. Classic Data Structures , Second Edition, Debasissamanta, PHI
5. Fundamentals of Data Structures in C, 2nd Edition, E. Horowitz, S.Sahni and Susan Anderson Freed, Universities Press

Reference Books:
1. Let us C,YashwantKanetkar, 6th Edition , BPB
2. C Programming and Data Structures, P.Padmanabham, Third Edition, BS Publications
3. C Programming, E.Balagurusamy, 3rd edition, TMHPublishers
4. Programming in C, Ashok N. Kamthane, AmitKamthane, Pearson
5. Data Structures: A Pseudo code Approach with C, 2nd Edition, R.F.Gilberg and B. A. Forouzan, Cengage Learning.
6. "Data Structures and Algorithm Analysis in C" by Weiss
7. "Data Structure Through C" by Yashavant P Kanetkar

E-resources:

https://www.geeksforgeeks.org/c-programming-language/

http://en.cppreference.com/w/c

https://onlinecourses.nptel.ac.in/noc19_cs42/

https://www.linuxtopia.org/online_books/programming_books/gnu_c_programming_tutorial/index.html

https://codeforwin.org/

Engineering Drawing		
Course Code	**L:T:P/D:C**	**Course Type**
22A0302T	**1: 0: 0/4 :3**	**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.

Syllabus		Total Hours:50
Unit - I	**Introduction to Engineering Drawing**	**10 Hrs**

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

Unit - II	**Projections of points, lines and planes**	**10 Hrs**

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.

Unit - III	**Projections of Solids**	**10 Hrs**

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

Unit - IV	**Sections of solids**	**10 Hrs**

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

Unit - V	**Development of surfaces**	**10 Hrs**

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

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)

Textbooks:

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.

COMMUNICATIVE ENGLISH LAB
(Common to all Branches of Engineering)

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

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 sounds, 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.

List of Experiments	Total Hours: 48

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

Course Outcomes:

On completion of this course, the students are 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, syllable division, stress, rhythm, intonation 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.

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. A Textbook of English Phonetics for Indian Students by T. Balasubramanyam

Online Learning Resources/Virtual Labs:

www.esl-lab.com

www.englishmedialab.com

www.englishinteractive.net

Applied Physics Lab					
(Common to ECE, EEE)					
Course Code	**L:T:P:S**	**Credits**	**Exam Marks**	**Exam Duration**	**Course Type**
22A0008P	**0:0:3:0**	**1.5**	**CIE:30 SEE:70**	**3H**	**BS**

Course Objectives:

This course will enable students to:

- 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

Syllabus	**Total Hours: 48**

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

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 its acceptance 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 Hall Effect.

Course Outcomes:

On completion of this course, the students are 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)

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:

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

C-PROGRAMMING & DATA STRUCTURES LAB					
(Common to ECE, EEE)					
Course Code	**L:T:P:S**	**Credits**	**Exam Marks**	**Exam Duration**	**Course Type**
22A0502P	**0:0:3:0**	**1.5**	**CIE:30 SEE:70**	**3Hours**	**ESC**

Course Objectives:

This course will enable students to:

- Work with an IDE to create, edit, compile, run and debug programs
- Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
- Design & develop of C programs using arrays, strings, pointers & functions.
- 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.

Syllabus	**Total Hours: 48**

List of Experiments

1. a) Write an algorithm to calculate and display the volume of a CUBE having its height (h=10cm), width (w=12cm) and depth (8cm).

    b) Write an algorithm to calculate area and Circumference of a circle.

    c) Write an algorithm to calculate simple interest for a given P, T, and R (SI = P*T*R/100)

2.a) Write a C program to find both the largest and smallest number in a list of integers.

 b) Write a C program that uses functions to perform the following:

 i) Addition of Two Matrices ii) Multiplication of Two Matrices

 3 a) Write a C program that uses functions to perform the following operations:

 i) To insert a sub-string in to a given main string from a given position.

 ii) To delete n characters from a given position in a given string.

 4 a) Write a C program to find sum and average of three numbers.

 b) Write C program to evaluate each of the following equations

 5a) Write a program in C to print individual characters of string in reverse order.

 b) Write a program in C to compare two strings without using string library functions.

 c) Write a C program to determine if the given string is a palindrome or not

 6 . a) Write C program to find GCD of two integers by using recursive function.

 b) Write C program to find GCD of two integers using non-recursive function

 7 .Write C programs that implement stack (its operations) using

 i) Arrays   ii) Pointers

 8. Write C programs that implement Queue (its operations) using

 i) Arrays ii) Pointers

9. Write a C program that uses Stack operations to perform the following:

i) Converting infix expression into postfix expression

ii) Evaluating the postfix expression

10. Write a C program that uses functions to perform the following operations on singly linked list.

i) Creation ii) Insertion iii) Deletion iv) Traversal

11. Write a C program that uses functions to perform the following operations on Doubly linkedlist.

i) Creation ii) Insertion iii) Deletion iv) Traversal

12. Write a C program that uses functions to perform the following operations on circular linkedlist.

i) Creation ii) Insertion iii) Deletion iv) Traversal

13 .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 postorder.

14. Write C programs that use both recursive and non-recursive functions to perform the following

searching operations for a key value in a given list of integers:

      i)   Linear search   ii) Binary search

15 .Write a C program that implements the following sorting methods to sort a given list of integers in

ascending order i) Bubble sort ii) Selection sort iii) Insertion sort

Course Outcomes:

On completion of this course, the students are able to:
- Use conditional and iterative statements for writing the C programs(L2)
- Make use of different data-structures like arrays, strings, structures for solving problems.(L2)
- Use basic data structures such as arrays, Stacks and Queues
- Programs to demonstrate fundamental algorithmic problems including Tree Traversals, Graph traversals
- Use various searching and sorting algorithms.
- Use linked structures, trees, and Graphs in writing programs

Text Books:

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)
3. Classic Data Structures , Second Edition, Debasissamanta, PHI

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

Reference Books:

1. C Programming and Data Structures, P.Padmanabham, Third Edition, BS Publications

2. C Programming, E.Balagurusamy, 3rd edition, TMHPublishers

3. .Programming in C, Ashok N. Kamthane, AmitKamthane, Pearson

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

5. "Data Structures and Algorithm Analysis in C" by Weiss

6. "Data Structure Through C" by Yashavant P Kanetkar
       "Problem Solving in Data Structures and Algorithms Using C: The Ultimate Guide to Programming Interviews" by Hemant Jain