VISION

To be recognized as a benchmark and trend setter in Electronics and Communication Engineering domain keeping in phase with rapidly changing technologies through effective partnership with reputed academic institutions, research organizations, industries and community.

MISSION

- Create highly motivated, technologically competent human resource by imparting high quality technical education through flexible student centric updated curricula suited to students with diverse backgrounds
- Adopt best teaching and learning practices and establish state-of-the-art facilities to provide quality academic ambience for innovativeness, research and developmental activities
- Enhance collaborative activities with academic institutions and industries for evolving indigenous technological solutions to meet societal needs and nurture leadership and entrepreneurship qualities with ethical means.
- Facilitate adequate exposure to the students, faculty and staff through training in the state-of-the-art technologies, efficient administration, global outreach and benchmarking against referential institutions

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO 1: The graduated students will demonstrate sufficient theoretical, analytical, and initiative skills in Basic Sciences and Engineering necessary to assimilate, analyze, synthesize, and innovate solutions to meet societal needs.

PEO 2: The graduated students will have inculcated a thirst for lifelong learning and sustained research interest.

PEO 3: The graduated students will practice values and exhibit leadership qualities and team spirit to promote entrepreneurship and indigenization.
PROGRAM OUTCOMES (POs)

Twelve GAs given by NBA as per Washington Accord agreement should be considered for all the UG programmes without any change for POs.

1 Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2 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.

3 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.

4 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.

5 Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6 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.

7 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.

8 Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9 Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10 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.

11 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.

12 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 (PSOs)

**PSO1:** The Students will be capable of analyzing and developing complex Electronics Systems containing Hardware and Software components.

**PSO2:** The Students will be capable of analyzing and developing complex Communication Systems containing Hardware and Software components.

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MAPPING OF PROGRAMME EDUCATIONAL OUTCOMES WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC COUTCOMES
# B. E. ELECTRONICS AND COMMUNICATION ENGINEERING

## CHOICE BASED CREDIT SYSTEM

### CURRICULA AND SYLLABI

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² NCC Credit Course level 1 is offered for NCC students only. Other students may enroll for NSS/NSO/YRC activity. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

* Also to be offered for lateral entry students in their 4th semester.
UNIT I BASICS OF COMMUNICATION
Listening – Telephone conversation & Writing message, gap filling; Reading – Telephone message, bio-note; Writing – Personal profile; Grammar – Simple present tense, Present continuous tense, Asking questions (wh-questions); Vocabulary – One word substitution, Synonyms

UNIT II NARRATION
Listening – Travel podcast / Watching a travel documentary; Reading – An excerpt from a travelogue, Newspaper Report; Writing – Narrative (Event, personal experience etc.); Grammar – Subject – verb agreement, Simple past, Past continuous Tenses; Vocabulary – Antonyms, Word formation (Prefix and Suffix).

UNIT III DESCRIPTION
Listening – Conversation, Radio/TV advertisement; Reading – A tourist brochure and planning an itinerary, descriptive article / excerpt from literature; Writing – Definitions, Descriptive writing, Checklists; Grammar – Future tense, Perfect tenses, Preposition; Vocabulary – Adjectives and Adverbs

UNIT IV CLASSIFICATION
Listening – Announcements and filling a table; Reading – An article, social media posts and classifying (channel conversion – text to table); Writing – Note making, Note taking and Summarising, a classification paragraph; Grammar – Connectives, Transition words; Vocabulary – Contextual vocabulary, Words used both as noun and verb, Classification related words.

UNIT V EXPRESSION OF VIEWS
Listening – Debate / Discussion; Reading – Formal letters, Letters to Editor, Opinion articles / Blogs; Writing – Letter writing/ Email writing (Enquiry / Permission, Letter to Editor); Grammar – Question tags, Indirect questions, Yes / No questions; Vocabulary – Compound words, Phrasal verbs.

Assessment
Two Written Assessments: 35% weightage each
Assignment: 30% weightage
Designing a tourist brochure / Writing an opinion article / Making a travel podcast

End Semester Exam: 3-hour written exam

TOTAL : 45 PERIODS

COURSE OUTCOMES
At the end of the course, students will be able to
CO1: Use grammar and vocabulary suitable for general context.
CO2: Comprehend the nuances of spoken and written communication.
CO3: Use descriptive and analytical words, phrases, and sentence structures in written communication.
CO4: Read different types of texts and comprehend their denotative and connotative meanings.
CO5: Write different types of texts using appropriate formats.

TEXT BOOKS:
1. “English for Engineers and Technologists” Volume I by Orient Blackswan, 2022
REFERENCES
4. www.uefap.com

CO-PO & PSO MAPPING

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1-low, 2-medium, 3-high

MA3151 MATRICES AND CALCULUS

UNIT I MATRICES (9+3)
Eigen values and Eigen vectors of a real matrix – Properties of Eigen values - Cayley-Hamilton theorem (excluding proof) – Diagonalization of matrices - Reduction of Quadratic form to canonical form by using orthogonal transformation - Nature of a Quadratic form.

UNIT II FUNCTIONS OF SEVERAL VARIABLES (9+3)

UNIT III INTEGRAL CALCULUS (9+3)
Improper integrals of the first and second kind and their convergence – Differentiation under integrals - Evaluation of integrals involving a parameter by Leibnitz rule – Beta and Gamma functions-Properties – Evaluation of integrals by using Beta and Gamma functions – Error functions.

UNIT IV MULTIPLE INTEGRALS (9+3)

UNIT V VECTOR CALCULUS (9+3)
Gradient of a scalar field, directional derivative – Divergence and Curl – Solenoidal and Irrotational vector fields - Line integrals over a plane curve - Surface integrals – Area of a curved surface – Volume Integral - Green’s theorem, Stoke’s and Gauss divergence theorems – Verification and applications in evaluating line, surface and volume integrals.

TOTAL: 60 PERIODS
OURSE OUTCOMES:
At the end of the course, the students will be able to:
CO1: Use the matrix algebra methods for solving practical problems.
CO2: Use differential calculus ideas on several variable functions.
CO3: Apply different methods of integration in solving practical problems by using Beta and Gamma functions.
CO4: Apply multiple integral ideas in solving areas and volumes problems.
CO5: Apply the concept of vectors in solving practical problems.

TEXT BOOKS:

REFERENCES:

CO-PO Mapping

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• 1’ = Low; ‘2’ = Medium; ‘3’ = High

PH3151 ENGINEERING PHYSICS

UNIT I MECHANICS OF MATERIALS
UNIT II OSCILLATIONS, SOUND AND THERMAL PHYSICS


UNIT III OPTICS AND LASERS


UNIT IV QUANTUM MECHANICS

Black body radiation (Qualitative) - Planck's hypothesis - Einstein's theory of Radiation - Matter waves - de Broglie hypothesis - Electron microscope - Uncertainty Principle - The Schrödinger Wave equation (time-independent and time-dependent) - Meaning and Physical significance of wave function - Normalization - Particle in an infinite potential well - particle in a three-dimensional box - Degenerate energy states - Barrier penetration and quantum tunneling - Tunneling microscope.

UNIT V CRYSTAL PHYSICS


TOTAL: 45 PERIODS

COURSE OUTCOMES:
After completion of this course, the students shall be

CO1: Understand the important mechanical properties of materials

CO2: Express the knowledge of oscillations, sound and applications of Thermal Physics

CO3: Know the basics of optics and lasers and its applications

CO4: Understand the basics and importance of quantum physics.

CO5: Understand the significance of crystal physics.

TEXT BOOKS:

REFERENCES:

CO-PO & PSO MAPPING

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CY3151 | ENGINEERING CHEMISTRY | 3 0 0 3

UNIT I POLYMER CHEMISTRY

UNIT II NANO CHEMISTRY

UNIT III CORROSION SCIENCE

UNIT IV ENERGY SOURCES
Batteries - Characteristics - types of batteries – primary battery (dry cell), secondary battery (lead acid, lithium-ion-battery)- emerging batteries – nickel-metal hydride battery, aluminum air battery, batteries for automobiles and satellites - Fuel cells (Types) – H2-O2 fuel cell - Supercapacitors-Types and Applications, Renewable Energy: Solar- solar cells, DSSC
UNIT V  WATER TECHNOLOGY  

**COURSE OUTCOMES:**

**CO1:** To recognize and apply basic knowledge on different types of polymeric materials, their general preparation methods and applications to futuristic material fabrication needs.

**CO2:** To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.

**CO3:** To recognize and apply basic knowledge on suitable corrosion protection technique for practical problems.

**CO4:** To recognize different storage devices and apply them for suitable applications in energy sectors.

**CO5:** To demonstrate the knowledge of water and their quality in using at different industries.

**TEXT BOOKS:**


**REFERENCES:**


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1-low, 2-medium, 3-high

**GE3153  PROGRAMMING IN C  L T P C  2 0 4 4**

**UNIT I  BASICS OF C PROGRAMMING  6+12**

Introduction to programming paradigms — Structure of C program - C programming: Data Types - Constants - Keywords - Operators: Precedence and Associativity - Expressions - Input/Output
statements, Assignment statements - Decision making statements - Switch statement.

PRACTICALS:
- Designing programs with algorithms/flowchart
- Programs for i/o operations with different data types
- Programs using various operators
- Programs using decision making and branching statements

UNIT II  LOOP CONTROL STATEMENTS AND ARRAYS  6+12
Iteration statements: For, while, Do-while statements, nested loops, break & continue statements - Introduction to Arrays: Declaration, Initialization - One dimensional array - Two dimensional arrays – Searching and sorting in Arrays – Strings – string handling functions - array of strings

PRACTICALS:
- Programs using for, while, do-while loops and nested loops.
- Programs using arrays and operations on arrays.
- Programs implementing searching and sorting using arrays
- Programs implementing string operations on arrays

UNIT III  FUNCTIONS AND POINTERS  6+12
Modular programming - Function prototype, function definition, function call, Built-in functions – Recursion – Recursive functions - Pointers -Pointer increment, Pointer arithmetic - Parameter passing: Pass by value, Pass by reference, pointer and arrays, dynamic memory allocation with malloc/calloc

PRACTICALS:
- Programs using functions
- Programs using recursion
- Programs using pointers & strings with pointers
- Programs using Dynamic Memory Allocation

UNIT IV  STRUCTURES AND UNION  6+12
Storage class, Structure and union, Features of structures, Declaration and initialization of structures, array of structures, Pointer to structure, structure and functions, typedef , bit fields , enumerated data types, Union.

PRACTICALS:
- Programs using Structures
- Programs using Unions
- Programs using pointers to structures and self-referential structures.

UNIT V  MACROS AND FILE PROCESSING  6+12

PRACTICALS:
- Programs using pre-processor directives & macros
- Programs to handle file operations
- Programs to handle file with structure
COURSE OUTCOMES:
Upon completion of the course, the students will be able to
CO1: Write simple C programs using basic constructs.
CO2: Design searching and sorting algorithms using arrays and strings.
CO3: Implement modular applications using Functions and pointers.
CO4: Develop and execute applications using structures and Unions.
CO5: Solve real world problem using files.

TOTAL PERIODS: 90 (30+60)

TEXT BOOKS:

REFERENCE BOOKS:

CO’s-PO’s & PSO’s MAPPING

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1 - low, 2 - medium, 3 - high

GE3155 ENGINEERING DRAWING

CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION)
Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE CURVES
Basic Geometrical constructions, Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola by eccentricity method — Construction of cycloid — construction of involutes of square and circle — Drawing of tangents and normal to the above curves.
UNIT II  PROJECTION OF POINTS, LINES AND PLANE SURFACE  6 + 12
Orthographic projection - Principal planes - First angle projection - projection of points. Projection of
straight lines (only First angle projections) inclined to both the principal planes - Determination of true
lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and
circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III  PROJECTION OF SOLIDS AND FREEHAND SKETCHING  6 + 12
Projection of simple solids like prisms, pyramids, cylinder, and cone when the axis is inclined to both the
principal planes by rotating object method. Visualization concepts and Free Hand sketching: Visualization
principles — Representation of Three-Dimensional objects — Layout of views - Freehand
sketching of multiple views from pictorial views of objects. Practicing three dimensional modeling of
simple objects by CAD Software (Not for examination).

UNIT IV  PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF
SURFACES  6 + 12
Sectioning of simple solids like prisms, pyramids, cylinder, and cone in simple vertical position when the
cutting plane is inclined to the one of the principal planes and perpendicular to the other — obtaining true
shape of section. Development of lateral surfaces of simple and sectioned solids — Prisms, pyramids
cylinders and cones. Development of lateral surfaces of solids with cut-outs and holes. Practicing three
dimensional modeling of simple truncated objects by CAD Software (Not for examination).

UNIT V  ISOMETRIC AND PERSPECTIVE PROJECTIONS  6 + 12
Principles of isometric projection — isometric scale - Isometric projections of simple solids and truncated
solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions -
Perspective projection of simple solids-Prisms, pyramids, cone and cylinders by visual ray method.
Creating isometric model of simple objects from orthographic projections using CAD software (Not for
examination).

TOTAL : 90 PERIODS

COURSE OUTCOMES:
On successful completion of this course, the student will be able to
CO1. Draw conic curves, cycloids and involutes
CO2. Draw orthographic projections of points, lines and planes
CO3. Draw orthographic projections and free hand sketches of solids
CO4. Draw sectional views of the objects and development of surfaces.
CO5. Draw isometric and perspective views of simple solids

TEXTBOOKS:

REFERENCES:
2. Gopalakrishna K.R., “Engineering Drawing” (Vol. I&II combined), Subhas Publications,
introduction to Interactive Computer Graphics for Design and Production, Eastern Economy

Publication of Bureau of Indian Standards:

CO-PO & PSO MAPPING

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GE3154 தமிழ் மரப்

அலகு I மரபு உறுப்பினர் தாக்கம்:

அலகு II மரப் – பராமரிக்கும் வழியாக திறந்த குறிப்பிட்டாக வைத்து வைத்து: 3
TEXT-CUM-REFERENCE BOOKS

1. The History of Tamil Nadu - Ashokapaadham - Dr. K. K. Pillay (Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

2. Tamil Society - Aduthal - K. K. Pillay (Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

3. Social Life of Tamils (Dr. K. K. Pillay) A joint publication of TNTB & ESC and RMRL – (in print)

4. Social Life of the Tamils - The Classical Period (Dr. S. S. Singaravelu) (Published by: International Institute of Tamil Studies).

5. The Contributions of the Tamils to Indian Culture (Dr. M. Valarmathi) (Published by: International Institute of Tamil Studies.)

6. Keeladi - ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

7. Studies in the History of India with Special Reference to Tamil Nadu (Dr. K. K. Pillay) (Published by: The Author)

8. Porunal Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

UNIT I LANGUAGE AND LITERATURE

UNIT II HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE
Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - Masssive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

UNIT III FOLK AND MARTIAL ARTS
Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

UNIT IV THINAI CONCEPT OF TAMILS
Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

UNIT V CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE
Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS
1. கற்பாட்டிடுதல் - மூர்த்தக்க பல்லவப்பெண்ணி – ஏ.எஸ். போர்ட்ஸ் (விள்ளைபை: கற்பாட்டிடுதல் மூர்த்தடங்கோள் பனேட்டுபெண்ணி கல்லறை).
2. கற்பாட்டிடுதல் - மூர்த்தக்க பல்லவப்பெண்ணி (விள்ளைபை: போர்ட்ஸ்).
3. மூர்த்தக்க பல்லவப்பெண்ணி கல்லறை – மூர்த்தக்க பல்லவப்பெண்ணி (விள்ளைபை: போர்ட்ஸ்).
4. போர்ட்ஸ் – மூர்த்தக்க பல்லவப்பெண்ணி (விள்ளைபை: போர்ட்ஸ்).
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7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. Keeladi - ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil
Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

PH3161                   PHYSICS LABORATORY                   L T P C
                                          0 0 2 1

Any SEVEN Experiments

1. Torsional Pendulum-Determination of rigidity modulus of wire and moment of inertia of the disc
2. Non-uniform bending - Determination of Young’s modulus of the material of the beam.
3. Uniform bending - Determination of Young’s modulus of the material of the beam.
4. Lee’s Disc Experiment - Determination of thermal conductivity of bad conductors.
5. Viscosity of Liquids.
6. Acoustic grating - Determination of the velocity of ultrasonic waves in liquids.
7. Ultrasonic interferometer – determination of sound velocity and liquids compressibility
8. Laser - Determination of the wavelength of the laser using grating
   - Determination of the width of the groove of the compact disc using laser.
   - Estimation of laser parameters.
9. Air wedge - Determination of the thickness of a thin sheet/wire
10. a) Optical fibre - Determination of Numerical Aperture and acceptance angle
    b) - Determination of bending loss of fibre.
11. Spectrometer - Determination of the wavelength of light using grating
12. Michelson Interferometer - Determination of wavelength of the monochromatic source of light.
13. Photoelectric effect – Determination of Planck’s constant
14. Black body radiation (Demonstration)
15. Melde’s string experiment - Standing waves.
16. Forced and Damped Oscillations.
17. Thermistor sensor
18. Thermocouple sensor
20. Design LCR series and parallel circuit and estimation of the resonant frequency.
22. Four Probe Set up – determination of band gap/resistivity of a material.

TOTAL: 30 PERIODS

COURSE OUTCOMES:
Upon completion of the course, the students will be able

CO1:  To determine various moduli of elasticity, thermal properties of materials and viscosity of liquids
CO2:  To determine the velocity of ultrasonic waves in Liquids.
CO3:  To calculate and analyze various optical properties.
CO4:  To build and analyze the characteristics of mechanical vibrations and logic operation.
CO5:  To determine the desired electric and magnetic parameters of materials, semiconductors devices
and sensors.

**CO-PO & PSO MAPPING**

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1-low, 2-medium, 3-high

**GE3162**

**ENGLISH LABORATORY – I**

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<th>SELF-INTRODUCTION</th>
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<td>Introducing oneself; Telephone conversation, Relaying telephone message – Role play</td>
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<td>Narrating one’s personal experience in front of a group (formal and informal context)</td>
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<td>Ex.: First day in college / vacation / first achievement etc.</td>
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<td>Making conversation – formal and informal – Turn taking and Turn giving – Small talk</td>
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<th>UNIT IV</th>
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<td>Giving short speeches on topics like College Clubs and their activities in the college / Campus Facilities / native place and its major attractions.</td>
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<th>DISCUSSION</th>
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<td>Taking part in a group discussion on general topics – Debating on topics of interest and relevance.</td>
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**Assessment**

- Internals – 100%
- Short Speeches
- Group discussion

**TOTAL : 30 PERIODS**

**COURSE OUTCOMES**

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

- **CO1.** Communicate effectively in formal and informal contexts
- **CO2.** Converse appropriately and confidently with different people
- **CO3.** Express their opinions assertively in group discussions

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CO-PO & PSO MAPPING

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HS3251 ENGLISH FOR COMMUNICATION – II

UNIT I CAUSE AND EFFECT
Listening – Radio / TV / Podcast Interview (survivors tale) and framing a set of instructions/ Do’s and Don’ts; Reading – Excerpts of Literature (short stories), Journal articles on issues like Global warming; Writing - Instructions; Official letter / email (Request for internship / Industrial visit); Grammar – If conditionals, Imperatives; Vocabulary – Cause and effect expressions, Idiom

UNIT II COMPARE AND CONTRAST
Listening – Product reviews and gap fill exercises, Short Talks (like TED Talks) for specific information; Reading – Graphical content (table / chart / graph) and making inferences; Writing – Compare and Contrast Essay; Grammar – Degrees of Comparison; Mixed Tenses; Vocabulary – Order of Adjectives, Transition words.

UNIT III PROBLEM AND SOLUTION
Listening – Group discussion (case study); Reading – Visual content (Pictures on social issues / natural disasters) for comprehension; Editorial; Writing Picture description; Problem and Solution Essay; Grammar – Modal verbs; Relative pronoun; Vocabulary – Negative prefixes, Signal words for problem and solution.

UNIT IV REPORTING
Listening – Oral news report; Reading – Newspaper report on survey findings – Writing – Survey report, Making recommendations; Grammar – Active and passive voice, Direct and Indirect speech; Vocabulary – Reporting verbs, Numerical adjectives.

UNIT V PRESENTATION
Listening – Job interview, Telephone interview; Reading - Job advertisement and company profile and making inferences; Writing – Job application (cover letter and CV) Grammar – Prepositional phrases; Vocabulary – Fixed expressions, Collocations.

Assessment
Two Written Assessments : 35% weightage each
Assignment: 30% weightage
Conducting a survey on specific topic and write a final survey report.

End Semester Exam: 3-hour written exam
COURSE OUTCOMES
On completion of the course, the students will be able to:
CO1. Listen effectively to various oral forms of conversation, lectures, discussion and understand the main gist of the content.
CO2. Communicate effectively in formal and informal context.
CO3. Read and comprehend technical texts effortlessly.
CO4. Write reports and job application for internship or placement.
CO5. Learn to use language effectively in a professional context.

TEXT BOOKS
1. “English for Engineers and Technologists” Volume 2 by Orient Blackswan, 2022

REFERENCES
4. www.uefap.com

CO-PO & PSO MAPPING

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MA3251 ORDINARY DIFFERENTIAL EQUATIONS AND TRANSFORM TECHNIQUES

UNIT I ORDINARY DIFFERENTIAL EQUATIONS (9+3)

UNIT II LAPLACE TRANSFORMS (9+3)
Existence theorem - Transform of standard functions – Transform of Unit step function and Dirac delta function – Basic properties - Shifting theorems - Transforms of derivatives and integrals – Transform of
periodic functions - Initial and Final value theorem - Inverse Laplace - Convolution theorem (without proof) – Solving Initial value problems by using Laplace Transform techniques.

UNIT III  
FOURIER SERIES  
(9+3)
Dirichlet’s conditions – General Fourier series – Odd and even functions – Half-range Sine and Cosine series – Complex form of Fourier series – Parseval’s identity – Harmonic Analysis.

UNIT IV  
FOURIER TRANSFORMS  
(9+3)
Fourier integral theorem – Fourier transform pair - Fourier sine and cosine transforms – Properties – Transform of elementary functions - Convolution theorem (without proof) – Parseval’s identity.

UNIT V  
Z – TRANSFORM AND DIFFERENCE EQUATIONS  
(9+3)

TOTAL: 60 PERIODS

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

CO1: Solve higher order ordinary differential equations which arise in engineering applications.

CO2: Apply Laplace transform techniques in solving linear differential equations.

CO3: Apply Fourier series techniques in engineering applications.

CO4: Understand the Fourier transforms techniques in solving engineering problems.

CO5: Understand the Z-transforms techniques in solving difference equations.

TEXT BOOKS:

REFERENCES:

CO-PO MAPPING

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UNIT I  ELECTRONIC STATES 9

UNIT II  CARRIERS AND DOPING 9

UNIT III  PN DIODE AND BIPOLAR JUNCTION TRANSISTOR 9
PN junction diode, current equations, V-I characteristics, Bipolar Junction Transistor- bipolar transistor action, minority carrier, distribution, low frequency common base, current gain, non-ideal effects, equivalent circuits, Ebers Moll Model, Hybrid-pi model, frequency limitations, large signal switching characteristics, SiGe and hetero-junction.

UNIT IV  FIELD EFFECT TRANSISTORS 9
Two terminal MOS structures, threshold voltage and charge distribution, capacitance-voltage characteristics, MOSFET structures, I-V relationships, transconductance and substrate effects, frequency limitations, non-ideal effects, MOSFET scaling, threshold voltage modification due to short and narrow channel effects, avalanche breakdown, drain induced barrier effects.

UNIT V  SPECIAL SEMICONDUCTOR DEVICES 9
SCR, IGBT, LED, LCD, Photo transistor, Opto Coupler, Solar cell, MESFET, Schottky barrier diode-Zener diode-Varactor diode –Tunnel diode-Gallium Arsenide device, LASER diode, UJT, LDR

TOTAL : 45 PERIODS

COURSE OUTCOMES:
At the end of the course, students will be able to
CO1: Understand the basics of electronic states and energy band structure formation
CO2: Recognize the importance of carrier concentration and doping in semiconductors
CO3: Understand the operation and characteristics of PN junction and BJTs.
CO4: Comprehend the characteristics of the field effect transistors.
CO5: Realize the physics of special semiconductor devices.

TEXT BOOKS:

REFERENCE BOOKS:

**CO-PO MAPPING**

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**EC3201 CIRCUIT THEORY**

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**UNIT I DC CIRCUIT ANALYSIS**


**UNIT II NETWORK THEOREM AND DUALITY**

Useful Circuit Analysis techniques using Independent and Dependent Sources- Linearity and superposition, Reciprocity Theorem, Thevenin and Norton Equivalent Circuits, Maximum Power Transfer, Delta-Wye Conversion. Duals, Dual circuits.

**UNIT III SINUSOIDAL STEADY STATE ANALYSIS**


**UNIT IV TRANSIENTS AND RESONANCE IN RLC CIRCUITS**


**UNIT V TOPOLOGY, COUPLED CIRCUITS & TWO PORT NETWORKS**

Magnetically Coupled Circuits, mutual Inductance, the Linear Transformer, the Ideal Transformer, An introduction to Network Topology, Trees and General Nodal analysis, Links and Loop analysis, Two port Network Analysis- Z, Y, G and H parameters.

**TOTAL : 45 PERIODS**
COURSE OUTCOMES:
At the end of the course, students will have
CO1: Ability to apply the basic laws for DC and AC circuits Analysis.
CO2: Ability to apply Network Theorems in DC and AC circuits.
CO3: Ability to analyse AC circuits for phase relationship and power calculation.
CO4: Ability to design and analyse first and second order AC circuits
CO5: Ability to analyse inductively coupled circuits and two port networks

TEXT BOOKS:

REFERENCE BOOKS:

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EC3202 DATA STRUCTURES AND PROGRAMMING IN C++ L T P C 2 0 4 4

UNIT I DATA ABSTRACTION & OVERLOADING 6

UNIT II INHERITANCE & POLYMORPHISM 6
Base Classes and Derived Classes — Protected Members — Casting Class pointers and Member Functions — Overriding — Public, Protected and Private Inheritance — Constructors and Destructors in
derived Classes — Implicit Derived — Class Object To Base — Class Object Conversion — Composition Vs. Inheritance — Virtual functions — This Pointer — Abstract Base Classes and Concrete Classes — Virtual Destructors — Dynamic Binding.

UNIT III LINEAR DATA STRUCTURES 6
Asymptotic Notations: Big-Oh, Omega and Theta — Best, Worst and Average case Analysis: Definition and an example — Arrays and its representations — Stacks and Queues — Linked lists — Linked list based implementation of Stacks and Queues — Evaluation of Expressions — Linked list based polynomial addition.

UNIT IV NON-LINEAR DATA STRUCTURES 6
Trees — Binary Trees — Binary tree representation and traversals — Threaded binary trees — Binary tree representation of trees — Application of trees: Set representation and Union-Find operations — Graph and its representations — Graph Traversals — Connected components.

UNIT V SORTING & SEARCHING 6
Insertion sort — Merge sort — Quick sort — Heap sort — Linear Search — Binary Search.

TOTAL : 30 PERIODS

List of Experiments:
1. C++ Program to Implement Constructors and Destructors.
2. C++ Program to implement Member Functions, Classes and Friend Functions.
3. C++ Program to Implement Dynamic Memory Allocation and Overloading.
4. C++ Program to Implement Various Inheritances.
5. C++ Program to Implement Virtual Functions and Dynamic Binding.
7. C++ Program to Implement Various Operations on Stacks and Queues using Array and Linked List.
8. C++ Program to Evaluate the Infix Expressions by converting into Prefix and Postfix Expressions.
9. C++ Program to Implement Binary Tree Traversal and Graph Traversal Algorithm.
10. C++ Program to Implement the Single Source Shortest Path Algorithm and All Pair Shortest Path Algorithm.
11. C++ Program to find the Minimal Spanning Tree for a Graph.
12. C++ Program to Implement Linear Search and Binary Search Algorithms.
13. C++ Program to Implement Insertion Sort, Merge Sort, Quick Sort and Heap Sort Algorithms.

TOTAL : 60 PERIODS

COURSE OUTCOMES:
At the end of the course, students will be able to
CO1: Comprehend and appreciate the significance and role of this course in the present contemporary world
CO2: Select and realize suitable data structure for specific Application.
CO3: Compare and realize Linear and nonlinear data structures for different application.
CO4: Implement different searching and sorting techniques.
CO5: Identify and realize connected components in trees.
**CO6:** Analyze and realize asymptotic notations.

**TEXT BOOKS:**

**REFERENCE BOOKS:**

**CO-PO MAPPING**

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**अभ्यास I**

**कविता पत्र महत्त्रिक विषय प्रमाणित:**

अभ्यास II

**अभ्यास III**

**अभ्यास IV**

के 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70.

அளவு IV தமிழகம் மாநிலங்களில் தொன்பரங்காக நீர்ப்பொருள் தெளிவிப்:

1. அமலாச்சார, தஞ்சாவுத்தூர், தஞ்சாவுத்தூர் மாநிலம் – சேவை தனிமை மற்றும் காங்கர் போர்க்களைப் – காங்கர் போர்க்களைப் பாதுகாப்பாக சேவையிடும் முழுக்கள்
2. தமிழகம் மாநிலங்களில் தொன்பரங்காக நீர்ப்பொருள் தெளிவிப்: வீடுகளுக்கு வன்முன்பு பெருக்காமல் – முன்முன்பு பெருக்காமல் – பெருக்காத காங்கர் தொன்பரங்காக அதிகரிக்க முடியும்.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

1. தமிழக வரலாறு – முக்கியமான பரப்பாகம் – கிறித்தூர் நூலையும் (இசைபறப்பு: தமிழக விளக்காமல் பார்க்கும்)
2. கல்லறை சமூகம் – வங்காளத் தீர்மான கட்டுப்பாடு (மோகில் பற்றியும்).
3. நிலையுடமுன்முன்முன்பு சமயக் கால நாட்கள் (சேவைகளை கனவு பற்றியும்)
4. பார்க்கும் – அரசியல் நடனக் கொள்கை (தமிழக விளக்காமல் பார்க்கும்)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. Keeladi - ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
UNIT I  WEAVING AND CERAMIC TECHNOLOGY  3
Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.

UNIT II  DESIGN AND CONSTRUCTION TECHNOLOGY  3
Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.

UNIT III  MANUFACTURING TECHNOLOGY  3

UNIT IV  AGRICULTURE AND IRRIGATION TECHNOLOGY  3
Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society.

UNIT V  SCIENTIFIC TAMIL & TAMIL COMPUTING  3

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS
1. தமிழக வரலொறு– மக்களும் பணவு பொடும் மக. மக. பிள்மள  (தவளியெடு: தமிழ்நொடு பொடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்)
2. கணினித் தமிழ் – முமனவர் இல.சுந்தரம்  (விகடன் பிரசுரம்)
3. செபொருமந – ஆற்றங்கமர நொகரிகம்  (ததொல்லியல் துமறதவளியீடு)
4. ஓப்பொருமந – குற்றுக்கோடு தொகுக்கிடும்  (ததொல்லியல் துமறதவளியீடு)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. Keeladi - ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr. K. K. Pillay) (Published by: The Author)

11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)


NX3251  (ARMY WING) NCC Credit Course Level - I  

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NX3252  (NAVAL WING) NCC Credit Course Level - I  

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### NATIONAL INTEGRATION AND AWARENESS

| NI 1 | National Integration: Importance & Necessity | 1 |
| NI 2 | Factors Affecting National Integration | 1 |
| NI 3 | Unity in Diversity & Role of NCC in Nation Building | 1 |
| NI 4 | Threats to National Security | 1 |

### PERSONALITY DEVELOPMENT

| PD 1 | Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving | 2 |
| PD 2 | Communication Skills | 3 |
| PD 3 | Group Discussion: Stress & Emotions | 2 |

### LEADERSHIP

| L 1 | Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code | 3 |
| L 2 | Case Studies: Shivaji, Jhasi Ki Rani | 2 |

### SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

| SS 1 | Basics, Rural Development Programmes, NGOs, Contribution of Youth | 3 |
| SS 4 | Protection of Children and Women Safety | 1 |
| SS 5 | Road / Rail Travel Safety | 1 |
| SS 6 | New Initiatives | 2 |
| SS 7 | Cyber and Mobile Security Awareness | 1 |

**TOTAL : 30 PERIODS**

**NCC Credit Course Level 1**

NX3253 (AIR FORCE WING) NCC Credit Course Level - I

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### NCC GENERAL

| NCC 1 | Aims, Objectives & Organization of NCC | 1 |
| NCC 2 | Incentives | 2 |
| NCC 3 | Duties of NCC Cadet | 1 |
| NCC 4 | NCC Camps: Types & Conduct | 2 |

### NATIONAL INTEGRATION AND AWARENESS

| NI 1 | National Integration: Importance & Necessity | 1 |
| NI 2 | Factors Affecting National Integration | 1 |
| NI 3 | Unity in Diversity & Role of NCC in Nation Building | 1 |
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### PERSONALITY DEVELOPMENT

| PD 1 | Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving | 2 |
| PD 2 | Communication Skills | 3 |
LEADERSHIP
L 1 Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code 3
L 2 Case Studies: Shivaji, Jhasi Ki Rani 2

SOCIAL SERVICE AND COMMUNITY DEVELOPMENT
SS 1 Basics, Rural Development Programmes, NGOs, Contribution of Youth 3
SS 4 Protection of Children and Women Safety 1
SS 5 Road / Rail Travel Safety 1
SS 6 New Initiatives 2
SS 7 Cyber and Mobile Security Awareness 1

TOTAL : 30 PERIODS

EC3211 ELECTRONIC DEVICES AND CIRCUITS LABORATORY

LIST OF EXPERIMENTS:
1. Characteristics of PN Junction Diode
2. Zener diode Characteristics & Regulator using Zener diode
3. Common Emitter input-output Characteristics
4. Common Base input-output Characteristics
5. FET Characteristics
6. SCR Characteristics
7. Clipper and Clamper & FWR Characteristics
8. Verification of Thevenin & Norton theorems
9. Verification of KVL & KCL
10. Verification of Super Position Theorem
11. Verification of Maximum Power Transfer & Reciprocity Theorem
12. Determination of Resonant Frequency of Series & Parallel RLC Circuits
13. Transient analysis of RL and RC circuits

TOTAL : 60 PERIODS

LABORATORY REQUIREMENTS:
BC 107, BC 148,2N2646, BFW10 - 25 each
1N4007, Zener diodes - 25 each
Resistors, Capacitors, Inductors - sufficient quantities
Bread Boards - 15 Nos
CRO (30MHz) – 10 Nos.
Function Generators (3MHz) – 10 Nos.
Dual Regulated Power Supplies (0 – 30V) – 10 Nos

COURSE OUTCOMES:
At the end of the course, students will have
CO1: Ability to apply the circuit laws and theorems
CO2: Ability to understand the functionality of electrical/electronic devices
CO3: Ability to measure and record the characteristics of electronic devices
CO4: Ability to validate the measured parameters with design
CO5: Ability to analyze RL, RC circuits

**CO-PO MAPPING**

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1' = Low; '2' = Medium; '3' = High

**CY3161 CHEMISTRY LABORATORY**

**LIST OF EXPERIMENTS:**
(Minimum of 8 experiments to be conducted)
1. Estimation of HCl using Na2CO3 as primary standard
2. Determination of alkalinity in water sample.
3. Determination of hardness of water by EDTA method.
4. Determination of DO content of water sample by Winkler’s method.
5. Determination of chloride content of water sample by Argentometric method.
6. Estimation of copper content of the given solution by iodometry.
7. Determination of strength of given hydrochloric acid using pH meter.
8. Determination of strength of acids in a mixture of acids using conductivity meter.
9. Estimation of iron content of the given solution using potentiometer.
10. Estimation of iron content of the water sample using spectrophotometer (1, 10-Phenanthroline/thiocyanate method).
11. Estimation of sodium and potassium present in water using flame photometer.
13. Determination of Glass transition temperature of a polymer
14. Phase change in a solid.
15. Corrosion experiment-weight loss method.

**TOTAL: 30 PERIODS**

**COURSE OUTCOMES:**
After completion of the laboratory course, the student will be able to –

**CO1:** analyse the water quality parameters for domestic and industrial purposes.

**CO2:** determine the amount of metal ions by spectroscopic techniques

**CO3:** select a suitable polymer for industrial applications.

**CO4:** quantitatively analyse the impurities in solution by electroanalytical techniques.

**CO5:** predict the choice of metals for industrial purposes using corrosion studies.
TEXTBOOKS:

CO - PO Mapping

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1 - low, 2 - medium, 3 - high

GE3261 ENGLISH LABORATORY – II

UNIT I INTERVIEW IN SOCIAL CONTEXT
Asking questions and answering - Conducting an interview (of an achiever / survivor) – Role play

UNIT II PERSUASIVE SKILLS
Speaking about specifications of a product (Eg. Home appliances) – Persuasive Talk – Role play activity.

UNIT III CASE STUDY
Discussions on Case Study to find solutions for problems in professional contexts – Analytical discussion on various aspects of a given problem.

UNIT IV VISUAL INTERPRETATION
Describing visual content (Pictures/Table/Chart) using appropriate descriptive language and making appropriate inferences and giving recommendations.

UNIT V PRESENTATION
Making presentation with visual component (PPT slides) (job interview / project / innovative product presentation)

Assessment
Internals – 100%
Picture / Graphical description and Interpretation
Formal Presentation with visual tool (like PPT)

TOTAL : 30 PERIODS

COURSE OUTCOMES
At the end of the course, students will be able to
CO1: Comprehend and transcode visual content appropriately.
CO2: Participate effectively in formal group discussions.
CO3: Make presentation on a given topic in a formal context.
## CO-PO & PSO MAPPING

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