VISION
Our vision is to become a prime center of excellence in imparting knowledge, nurturing cutting-edge research, driving best practices and fostering technological innovations in the fields of ceramic science and technology.

MISSION
- To empower the student community through strong academic curriculum balanced with pioneering research and industrial collaborations.
- To nurture technically competent talents by augmenting the potential of traditional & advanced ceramics to promote entrepreneurship, technology transfer and contribute to the attainment of sustainable future.
- To support the development of Ceramic Technologists possessing depth of character and social responsibility with values and integrity
- To develop a processing and testing Centre for Excellence to cater the needs of ceramics and allied industries globally.
PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

i. Proficiency in applying Engineering concepts/technology/tools/software to cater societal needs.
ii. Competent to adapt new technological developments using profound understanding on the rudiments of ceramics with the undertone of sustainability.
iii. Recognize the potential of continuous learning and professional development for career advancements.
iv. Ability to work as an effective team player by understanding diverse perspectives/group dynamics.
v. Exhibit leadership qualities and problem solving capability as an entrepreneur/manager, inspiring team members to achieve common goals.

PROGRAMME OUTCOMES (POs)

After going through the four years of study, our Ceramic Technology Graduates will exhibit ability in:

<table>
<thead>
<tr>
<th>Graduate Attribute</th>
<th>Programme Outcome</th>
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<tr>
<td>PO1  Engineering knowledge</td>
<td>Enhance the knowledge in mathematics, basic science and engineering science.</td>
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<td>PO2  Problem analysis</td>
<td>Capable of Identifying engineering problems and formulating tools to solve the same.</td>
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<td>PO3  Design/development of solutions</td>
<td>Design a system or process to improve its performance within the constraints</td>
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<td>PO4  Conduct investigations of complex problems</td>
<td>Ability to conduct experiments and collecting data, analyzing and drawing inferences. Usage of Modern tools</td>
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<td>PO5  Usage of Modern tools</td>
<td>Use modern tools and techniques to improve the efficiency of the system.</td>
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<td>PO6  The Engineer and society</td>
<td>Ability to have Professional excellence and strive for societies upliftment</td>
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<td>PO7  Environment and sustainability</td>
<td>Design to be environment conscious and growth oriented</td>
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<td>PO8  Ethics</td>
<td>To boost the industry, business and society in a professional and ethical manner.</td>
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<td>PO9  Individual and team work</td>
<td>Composition of an integrated team.</td>
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<td>PO10 Communication</td>
<td>Proficiency in oral and written Communication.</td>
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<td>PO11 Project management and finance</td>
<td>To be innovatively progressive within resources</td>
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<tr>
<td>PO12 Life-long learning</td>
<td>Continue professional development and learning as a life-long activity.</td>
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</table>
PROGRAM SPECIFIC OUTCOMES (PSOs):
By the completion of Ceramic Technology undergraduate program, the student will have the following program specific outcomes:

1. Familiarization of fundamental concepts and problem solving ability in basic engineering and ceramic technology.
2. Comprehensive knowledge on selection of ceramic raw materials and processing methods to contribute in process optimization and product development.
3. Promote aptitude for various characterization techniques with data interpretation to understand material properties for design & evaluation of ceramic products.

PEO / PO Mapping:

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<th>PROGRAMME EDUCATIONAL OBJECTIVES</th>
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$ Skill Based Course

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$ 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.

$ Skill Based Course.
OBJECTIVES

- To build lexical competency and accuracy that will help learners to use language effectively.
- To comprehend the nuances of spoken and written communication in different contexts.
- To learn and use various language functions required for effective communication.
- To read and write different types of texts and comprehend their connotative and denotative meanings.
- To enhance students' listening skills by using different types of audio materials and help them extract necessary information from those materials.

UNIT I  BASICS OF COMMUNICATION  9
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  9
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  9
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  9
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  9
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 Science & Technology I” by Cambridge University Press, 2023
2. “English for Engineers and Technologists” Volume I by Orient Blackswan, 2022

Reference Books
4. www.uefap.com

CO-PO & PSO MAPPING

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MA3151 MATRICES AND CALCULUS L T P C
3 1 0 4

COURSE OBJECTIVES:
• To develop the use of matrix algebra techniques in solving practical problems.
• To familiarize the student with functions of several variables.
• To solving integrals by using Beta and Gamma functions.
• To acquaint the student with mathematical tools needed in evaluating multiple integrals.
• To acquaint the students with the concepts of vector calculus which naturally arises in many engineering problems.

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

COURSE 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

OBJECTIVES

- To impart knowledge on Mechanics of Materials.
- To impart knowledge of oscillations, sound and Thermal Physics
- To facilitate understanding of optics and its applications, different types of Lasers and fiber optics.
- To introduce the basics of Quantum Mechanics and its importance.
- To familiarize with crystal structure, bonding and crystal growth.

UNIT I MECHANICS OF MATERIALS


UNIT II OSCILLATIONS, SOUND AND THERMAL PHYSICS


UNIT III OPTICS AND LASERS


UNIT IV QUANTUM MECHANICS


UNIT V CRYSTAL PHYSICS

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

OBJECTIVES:
- To introduce the basic concepts of polymers, their properties and some of the important applications.
• To impart knowledge on the basic principles and preparatory methods of nanomaterials.
• To facilitate the understanding of corrosion science and protecting coatings.
• To familiarize the operating principles and applications of energy conversion, its processes and storage devices.
• To inculcate sound understanding of water quality parameters and water treatment techniques.

UNIT I POLYMER CHEMISTRY

UNIT II NANOCHEMISTRY

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

TOTAL: 45 PERIODS

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:**

**REFERENCE BOOKS:**

**CO - PO Mapping**

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**GE3153**  
**PROGRAMMING IN C**

**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 Hours: 90 (30+60)

TEXT BOOKS:

REFERENCE BOOKS:
GE3155  ENGINEERING DRAWING  L T P C
CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION)  2
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  4 + 12
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:**


**Publication of Bureau of Indian Standards:**


**CO-PO & PSO MAPPING**

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14
COURSE OBJECTIVES:
The objectives of this course are to impart knowledge on the basics of manufacturing processes, IC Engines, and power generation.

UNIT I CASTING, FORMING, AND WELDING PROCESSES 6
Sand casting, lathe machine and its parts, lathe machine operations (turning, taper turning, facing, chamfering, etc.), Drilling, forming process – Bulk Deformation (Forging, Rolling), Sheet metal operation (Blanking, punching)

UNIT II WELDING AND ADDITIVE MANUFACTURING 6
Welding – types, Shielded Metal Arc Welding, gas welding, MIG and TIG welding, Additive manufacturing : Types and its applications

UNIT III THERMODYNAMICS 6
Basic Terminologies related to Thermodynamics, zeroth Law, First Law of thermodynamics, Second Law of thermodynamics, Third Law of thermodynamics, Vapor compression cycle, Air Conditioner and Refrigerator

UNIT IV IC ENGINES AND RECENT DEVELOPMENTS 6

UNIT V POWER PLANT ENGINEERING 6
Coal based power plants- working, advantages & disadvantages, Hydro Electric power plants- working, advantages & disadvantages, nuclear power plants- Types, working, advantages & disadvantages, solar power plant- working, advantages & disadvantages, wind-based power generation- working, advantages & disadvantages

TOTAL : 30 PERIODS

COURSE OUTCOMES:
CO1 Discuss the basic concepts of casting, forming, and machining processes
CO2 Explain welding, and Additive manufacturing
CO3 Discuss the basics laws and application of thermodynamics
CO4 Summarize the basics of IC engines, electric vehicles.
CO5 Explain various power generation methods

TEXTBOOKS:
4. A TEXTBOOK OF MANUFACTURING TECHNOLOGY by RK Rajput, December 2007, Panchu Publisher
5. A Text-Book of Production Technology Volume I by O.P.KHANNA, Dhanpat Rai publications

REFERENCES:
Each course must contain only five units with equal distribution of hours.

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GE3154

**Course Title:**

**LTPC:**

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**Teacher:**

**Course Description:**

Each course must contain only five units with equal distribution of hours.
அலகு வினாயகம் என்னும் அல்கு வினாயகப் பத்மாரின் புத்தகத்தின் பலகைப்பின்:

இந்தியகாரணிய பொட்டியுடைய தமிழர்களின் பங்களிப்பு:

அல்கு வினாயகப் பத்மாரின் புத்தகத்தின் பலகைப்பின் பங்களிப்பு:

India - வினாயகப் பத்மாரின் புத்தகத்தின் பலகைப்பின் பங்களிப்பு:

72x758

292x52

17

TEXT-CUM-REFERENCE BOOKS

1. தமிழ் வரலொறு - மரண வினாயகப் பத்மாரின் - கு.கு. பிள்மளர் (மகளியீடு: தமிழ்நொடு பொடநூல் தமிழ்ப்பணிகள் கழகம்).
2. சுந்தர வினாயகப் பத்மாரின் - மகளியீடு (மகளியீடு).
3. விளாண் - தமிழ் வினாயகப் பத்மாரின் சம்பந்த தொகுதிகள் (சார்பநோன்றால் தொகுதிகள்).
4. பாகைத்தம் - தமிழ் வினாயகப் பத்மாரின் (சார்பநோன்றால் தொகுதிகள்)
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)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book

GE3154 HERITAGE OF TAMILS

L T P C

1 0 0 1

UNIT I LANGUAGE AND LITERATURE


UNIT II HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE


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  THINAICONCEPTOFTAMILS

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-REFERENCEBOOKS

1. தமிழக வரலொறு – மக பண்பொடு - மக பிள்மள (மவளியீடு: தமிழ்நொடு பொடநூல் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் – முமனவர் இல சுந்தர (சுந்தர பிரசுரம்).
3. கீழடி – மாகநரு நதிக்கமர்யில் தாங்ககல் காங்க கருவிகள் (மதொல்லியல் துமற்மவளியீடு).
4. மபொருமந – ஆற்றங்கமர் (மதொல்லியல் துமற்மவளியீடு).
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).
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10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Publishedby: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Bookand Educational Services Corporation, Tamil Nadu)

PH3161  PHYSICS LABORATORY  L T P C
0 0 2 1

Any SEVEN Experiments

OBJECTIVES:

- To inculcate experimental skills to test basic materials' properties including materials mechanical, thermal and optical properties.
- To induce the students to familiarize themselves with the properties of sound waves and ultrasonic waves.
- To impart practical skills and to understand the characteristics of mechanical vibrations and logic operation.
- To elucidate to understand the electric and magnetic parameters of materials and semiconductors devices and sensors.
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.

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GE3162 ENGLISH LABORATORY – I

UNIT I SELF-INTRODUCTION
Introducing oneself; Telephone conversation, Relaying telephone message – Role play

UNIT II NARRATION
Narrating one’s personal experience in front of a group (formal and informal context)
UNIT III  CONVERSATION  6
Making conversation – formal and informal – Turn taking and Turn giving – Small talk

UNIT IV  SHORT SPEECH  6
Giving short speeches on topics like College Clubs and their activities in the college / Campus Facilities / native place and its major attractions.

UNIT V  DISCUSSION  6
Taking part in a group discussion on general topics – Debating on topics of interest and relevance.

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

CO-PO & PSO MAPPING

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HS3251  ENGLISH FOR COMMUNICATION – II  3 0 0 3

UNIT I  CAUSE AND EFFECT  9
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  9
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  9
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

TOTAL : 45 PERIODS

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
2. “English for Engineers and Technologists” by Orient Blackswan, 2022

REFERENCE BOOKS
4. www.uefap.com

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1-low, 2-medium, 3-high, '-'- no correlation
MA3251  ORDINARY DIFFERENTIAL EQUATIONS AND TRANSFORM TECHNIQUES  L T P C  3 1 0 4

COURSE OBJECTIVES:

- To acquaint the students with Differential Equations which are significantly used in engineering problems.
- To make the students to understand the Laplace transforms techniques.
- To develop the analytic solutions for partial differential equations used in engineering by Fourier series.
- To acquaint the student with Fourier transform techniques used in wide variety of situations in which the functions used are not periodic.
- To develop Z-transform techniques in solving difference equations.

UNIT I  ORDINARY DIFFERENTIAL EQUATIONS  (9+3)

UNIT II  LAPLACE TRANSFORMS  (9+3)

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) – Parsevals’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:

COPO Mapping

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EE3151 BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

UNIT – I ELECTRICAL CIRCUITS
9

UNIT – II ELECTRICAL MACHINES
9

UNIT – III ANALOG AND DIGITAL ELECTRONICS
9

UNIT – IV SENSORS AND TRANSDUCERS
9
Solenoids, electro-pneumatic systems, proximity sensors, limit switches, piezoelectric, Hall effect, photo sensors, Strain gauge, LVDT, differential pressure transducer, optical and digital transducers, Smart sensors, Thermal Imagers.

UNIT – V MEASUREMENTS AND INSTRUMENTATION
9
Functional Elements of an Instrument, Error analysis; Operating Principle - Moving Coil and

TOTAL: 45 PERIODS

Laboratory Experiments:
LIST OF EXPERIMENTS:

ELECTRICAL
1. Verification of ohms and Kirchhoff’s Laws.
2. Load test on DC Shunt Motor.
3. Load test on Single Phase Transformer.
4. Load test on 3 Phase Induction Motor.

ELECTRONICS
1. Half wave and full wave Rectifiers.
2. Application of Zener diode as shunt regulator.
3. Inverting and non-inverting amplifier using operational amplifier.

TOTAL: 30 PERIODS

COURSE OUTCOMES
Upon successful completion of the course, students should be able to:
CO 1: Compute and demonstrate the electric circuit parameters for simple problems.
CO 2: Explain the working principles and characteristics of electrical machines, electronic devices and measuring instruments.
CO 3: Identify general applications of electrical machines, electronic devices and measuring instruments.
CO 4: Analyze and demonstrate the basic electrical and electronic circuits and characteristics of electrical machines.
CO 5: Explain the types and operating principles of sensors and transducers.

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1 – Slight, 2 – Moderate, 3 – Substantial

TEXT BOOKS:

REFERENCES:
BE3151 BASIC CIVIL ENGINEERING

UNIT I CIVIL ENGINEERING MATERIALS
Traditional materials - Stone, timber, brick, lime, cement - Mortars - Concrete - Metals - Bitumen - Paints - Tiles.

UNIT II BUILDING CONSTRUCTION
Building elements - Planning - Types of buildings - Super structure - Substructure - Damp proofing.

UNIT III SURVEYING
Principles of surveying - Classification of surveying - Chain surveying - Compass surveying - Levelling - Theodolite - Total station - GIS - Remote sensing.

UNIT IV WATER SUPPLY AND SANITATION

UNIT V DISASTER MANAGEMENT
Types of disaster - Earthquake - Wind - Cyclone - Flood - Fire - Precautions to be taken - Disaster management and planning.

TOTAL: 30 PERIODS

COURSE OUTCOMES:
On completion of this course, the student is expected to be able to:

CO1 Identify the civil engineering materials for construction
CO2 Gain knowledge on construction of buildings
CO3 Acquire basic knowledge on various types of surveying
CO4 Get familiarized with the importance of water supply and sanitary engineering
CO5 Gain awareness on various natural disasters and their mitigation

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**CO-PO-PSO MAPPING: BASIC CIVIL ENGINEERING**
TEXT-CUM-REFERENCEBOOKS

1. Tamil History - Sangam Period (Dr.K.K.Pillay) (Published by: International Institute of Tamil Studies).
2. Tamil History - The Classical Period (Dr.S.S.Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
3. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies).
4. 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)
5. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
6. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

UNIT I
WEAVING AND CERAMIC TECHNOLOGY

Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.

UNIT II
DESIGN AND CONSTRUCTION TECHNOLOGY

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

UNIT IV AGRICULTURE AND IRRIGATION TECHNOLOGY
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

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS
1. தமிழக வரலொறு – மாற்றம் புரூட்டியது என்கின்றது (தமிழ்விளகி: புரூட்டியன் புரூட்டியது புரூட்டியன் புரூட்டியது).
2. கல்விதரும் மாற்றம் – மாற்றார் முன். கல்வியகம். (முன் பிரசுரம்).
3. கல்வி – தமிழக தொழிலகம் சமீக்கும் கை தாழ்கிதம் (தமிழ்விளகி: கல்வி செயல்).
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) (Publishedby: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

NCC Credit Course Level 1*
NX3251 (ARMY WING) NCC Credit Course Level - I

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

NATIONAL INTEGRATION AND AWARENESS  4
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  7
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  5
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  8
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*
NX3252  (NAVAL WING) NCC Credit Course Level – I  L T P C
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NCC GENERAL  6
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  4
NI 1  National Integration: Importance & Necessity  1
NI 2  Factors Affecting National Integration  1
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PERSONALITY DEVELOPMENT  7
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

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## SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

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**TOTAL : 30 PERIODS**

### NCC Credit Course Level 1*

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### NATIONAL INTEGRATION AND AWARENESS

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### PERSONALITY DEVELOPMENT

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### LEADERSHIP

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### SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

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<td>Road / Rail Travel Safety</td>
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<td>New Initiatives</td>
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<td><strong>SS 5</strong></td>
<td>Cyber and Mobile Security Awareness</td>
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**TOTAL : 30 PERIODS**

### CHEMISTRY LABORATORY

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<td><strong>LIST OF EXPERIMENTS:</strong></td>
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<td>1. Estimation of HCl using Na₂CO₃ as primary standard</td>
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<td>2. Determination of alkalinity in water sample.</td>
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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 -
- analyse the water quality parameters for domestic and industrial purposes.
- determine the amount of metal ions by spectroscopic techniques.
- select a suitable polymer for industrial applications.
- quantitatively analyse the impurities in solution by electroanalytical techniques.
- 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, '-' - no correlation

GE3161 ENGINEERING PRACTICES LABORATORY L T P C 0 0 4 2

COURSE OBJECTIVE:
To provide exposure to the students with hands-on experience on various Basic Engineering Practices in Civil, Mechanical, Electrical and Electronics Engineering.

GROUP – A (CIVIL & ELECTRICAL)
1. CIVIL ENGINEERING PRACTICES

PLUMBING:
Basic pipe connections involving the fittings like valves, taps, coupling, unions, reducers, elbows and other components used in household fittings. Preparation of plumbing line sketches.
   a) Laying pipe connection to the suction side of a pump
   b) Laying pipe connection to the delivery side of a pump.
   c) Practice in connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances.

WOOD WORK:
Sawing, planing and making joints like T-Joint, Mortise and Tenon joint and Dovetail joint.

STUDY EXCERISSIES
a) Study of joints in door panels and wooden furniture
b) Study of common industrial trusses using models.

2. ELECTRICAL ENGINEERING PRACTICES

a) Basic household wiring using Switches, Fuse, Indicator and Lamp etc.,
b) Stair case light wiring
c) Tube – light wiring
d) Preparation of wiring diagrams for a given situation.
e) Study of Iron-Box, Fan Regulator and Emergency Lamp

3. MECHANICAL ENGINEERING PRACTICES

WELDING
   a) Arc welding of Butt Joints, Lap Joints, and Tee Joints
   b) Gas welding demonstration.
   c) Basic Machining - Simple turning, drilling and tapping operations.
   d) Study and assembling of the following: Centrifugal pump, Mixer, Air-conditioner

SHEET METAL PRACTICE: Making of a square tray

DEMONSTRATION ON FOUNDRY OPERATIONS.

4. ELECTRONIC ENGINEERING PRACTICES

a) Soldering simple electronic circuits and checking continuity.
b) Assembling electronic components on a small PCB and Testing.
c) Study of Telephone, FM radio and Low Voltage Power supplies.

TOTAL: 60 PERIODS

COURSE OUTCOMES:
1. Ability to make common joints in carpentry and pipe connections with fittings used in plumbing works.
2. Ability to do electrical wiring for household applications.
3. Ability to weld the steel the structures and soldering of electronical connections and testing of PCBs

CO-PO & PSO MAPPING

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OBJECTIVES
- To comprehend visual material and transcode it into verbal content using appropriate register.
- To identify varied group discussion skills and apply them to take part in effective discussions in professional context.
- To use language effectively in a formal presentation.

UNIT I INTERVIEW IN SOCIAL CONTEXT 6
Asking questions and answering - Conducting an interview (of an achiever / survivor) – Role play

UNIT II PERSUASIVE SKILLS 6
Speaking about specifications of a product (Eg. Home appliances) – Persuasive Talk – Role play activity.

UNIT III CASE STUDY 6
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 6
Describing visual content (Pictures/Table/Chart) using appropriate descriptive language and making appropriate inferences and giving recommendations.

UNIT V PRESENTATION 6
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.

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- 1-low, 2-medium, 3-high, "-"- no correlation
- **Note:** The average value of this course to be used for program articulation matrix.