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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</thead>
<tbody>
<tr>
<td>PO1 Engineering knowledge</td>
<td>Enhance the knowledge in mathematics, basic science and engineering science.</td>
</tr>
<tr>
<td>PO2 Problem analysis</td>
<td>Capable of identifying engineering problems and formulating tools to solve the same.</td>
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<tr>
<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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<tr>
<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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<tr>
<td>PO7 Environment and sustainability</td>
<td>Design to be environment conscious and growth oriented.</td>
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<tr>
<td>PO8 Ethics</td>
<td>To boost the industry, business and society in a professional and ethical manner.</td>
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<tr>
<td>PO9 Individual and team work</td>
<td>Composition of an integrated team.</td>
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<tr>
<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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ANNA UNIVERSITY, CHENNAI
UNIVERSITY DEPARTMENTS
B.TECH. CERAMIC TECHNOLOGY
REGULATIONS - 2023
CHOICE BASED CREDIT SYSTEM
CURRICULUM AND SYLLABI FOR SEMESTERS I AND II

SEMESTER I

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PRACTICALS

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*Skill Based Course

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TOTAL 12 1 10 23 18

* 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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- 1-low, 2-medium, 3-high, "-" no correlation

### MA3151 MATRICES AND CALCULUS

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
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

UNIT V VECTOR CALCULUS
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.

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:
PH3151

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


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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• 1’ = Low; ‘2’ = Medium; ‘3’ = High
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) – \( \text{H}_2-\text{O}_2 \) 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
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  
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  
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  
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  

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:

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1 - low, 2 - medium, 3 - high, '-' - no correlation

GE3155 ENGINEERING DRAWING
L T P C
2 0 4 4

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
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
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:

Special points applicable to University Examinations on Engineering Drawing:
1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets only in the size of A3.
4. The students will be permitted to use appropriate scale to fit the solution within A3 size.
5. The examination will be conducted in appropriate sessions on the same day.

CO-PO & PSO MAPPING

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BE3152 BASIC MECHANICAL ENGINEERING L T P C 2 0 0 2

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 தமிழ் மொழி L T P C 1 0 0 1

அக்தர் I தமிழியல் தொழிய்யல்
அலகு II  மனப - பல தமிழ்ப்பகுதிகளின் முதல் தொடக்கத்தில் மனப -
சிற்பக் கறல்: 3
தமிழ் மொழியில் கினிமனாளிகள் மனப - தூத்துக்காட்டி சிற்பங்கள் மனப -
புரூபங்கள் மனப - சிற்பக் கறல் - வொட்டுப்புறத் தமிழ் சிற்பங்கள் -
விசைகள், பலியும் பார், தமிழியல் - சிற்பக் கறல் தமிழ்
்பார்க்கவங்கள் வாரியின் சிற்பக் கறலிகள் மனப.

அலகு III  நடுகல் முதல் நவீன சிற்பங்கள்: 3
தமிழ்முழுக்கத்தில், கருப்பளர்பு, கருத்துறுத்தை, புரூபங்கள்,
வைக்காட்டினார்கள், வாரிகள், புத்தகங்கள், சிற்பங்கள் மற்றும்
சிற்பக் கறல்

அலகு IV  சிற்பக் கறல் சிற்பங்கள்: 3
சிற்பக் கறல் சிற்பங்கள், சிற்பக் கறல் - சிற்பக் கறல் சிற்பங்கள்
நடுகல் முதல் நவீன சிற்பங்கள் - தமிழ்முழுக்கத்தில்
நடுகல் முதல் நவீன சிற்பங்கள் - சிற்பக் கறல்
எப்பிள்மளாக ஆண்டு முதல் - தமிழ்முழுக்கத்தில்
சிற்பங்கள் மற்றும் சிற்பக் கறல்

அலகு V  இந்தியக் கதசிய இயக்கம்: 3
இந்தியக் கதசிய இயக்கம் - இந்தியக் கதசிய இயக்கம்
இந்தியாவின் பங்களிப்பு - இந்தியாவின் பங்களிப்பு
இந்தியாவின் பங்களிப்பு - இந்தியாவின்

TEXT-CUM-REFERENCEBOOKS
1. தமிழ் வரலை - பலகள் புரூபங்கள் (தூத்துக்காட்டியில்: சிற்பக் கறல்
முதலில் பலகள் புரூபங்கள் சிற்பக் கறல்)
2. தமிழியல் பொடி - பலகள் வாரியும் (சிற்பக் கறல்)
3. சிற்பங்கள் - தமிழியல் பொடிகள் சிற்பங்கள் மற்றும் சிற்பக்
சிற்பங்கள் மற்றும் சிற்பக் கறல் - கால்பொருள்
சிற்பங்கள் மற்றும் சிற்பக் கறல்
4. ப்ள்ம்மளாக ஆண்டு முதல் - இந்தியக் கதசிய இயக்கம் (தூத்துக்காட்டியில்: சிற்பக்
கறல்
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 Bookand Educational Services Corporation, Tamil Nadu)

TOTAL : 15 PERIODS
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book

GE3154 HERITAGE OF TAMILS

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 – க்களு பண்பொடு – மக மக பிள்மள (மவளியீடு: தமிழ்நொடு பொடநூல் கல்வியியல் பணிகள் கழக).
2. கணினித் தமிழ் – முமனவர் இல. (விகடன் பிரசு).
3. கீழடி – மவமகநதிக்கமரயில் எங்ககொல நகரிக (மதொல்லியல் துமற் மவளியீடு).
4. மபொருமந – ஆற்றங்கமர் நொகரிக. (மதொல்லியல் துமற் மவளியீடு)
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).
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    Text Bookand Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) –
    Reference Book.

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**  
6
Introducing oneself; Telephone conversation, Relaying telephone message – Role play

**UNIT II**  
**NARRATION**  
6
Narrating one’s personal experience in front of a group (formal and informal context)  
Ex.: First day in college / vacation / first achievement etc.

**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

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</table>
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

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

<table>
<thead>
<tr>
<th>Course Articulation Matrix</th>
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1-low, 2-medium, 3-high, ‘¬’- no correlation

MA3251 ORDINARY DIFFERENTIAL EQUATIONS AND TRANSFORM TECHNIQUES 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 F  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)
Z-transform – Elementary properties – Inverse Z-transform – Convolution theorem – Initial
and final value theorems – Formation of difference equation – Solution of difference equation
using Z- transform.

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 seriestechniques 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:
New Delhi, 2017.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley India Pvt Ltd., New
Delhi, 2015.

REFERENCES:
Reprint, New Delhi, 2010.

COPO Mapping

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<tr>
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1-low, 2-medium, 3-high, '-'- no correlation

EE3151  BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING  L T P C
3 0 2 4

UNIT – I  ELECTRICAL CIRCUITS  9
DC Circuits: Ohm’s Law - Kirchhoff’s Laws – Independent and Dependent Sources – Nodal
Analysis, Mesh analysis with Independent sources only (Steady state) – AC Fundamentals:
Waveforms, Average value, RMS Value, Impedance, Instantaneous Power, Real Power,
Reactive Power and Apparent Power, Power Factor – Steady State Analysis of RL and RC Circuits - Introduction to Balanced 3-Phase Circuits and power measurement.

UNIT – II  ELECTRICAL MACHINES

UNIT – III  ANALOG AND DIGITAL ELECTRONICS
Operation and Characteristics of electronic devices: PN Junction Diodes, Zener Diode, BJT, JFET and MOSFET– Operational Amplifiers (OPAMPs) : Characteristics and basic application circuits-555 timer IC based astable and monostable multivibrator. Basic switching circuits – Gates and Flip-Flops-Sample and hold circuit- R-2R ladder type DAC- Successive approximation based ADC.

UNIT – IV  SENSORS AND TRANSDUCERS
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

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.
### Mapping of COs with POs and PSOs

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1 – Slight, 2 – Moderate, 3 – Substantial

### TEXT BOOKS:

### REFERENCES:

### BE3151 BASIC CIVIL ENGINEERING

<table>
<thead>
<tr>
<th>UNIT I</th>
<th>CIVIL ENGINEERING MATERIALS</th>
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<tr>
<td></td>
<td>Traditional materials - Stone, timber, brick, lime, cement - Mortars - Concrete - Metals - Bitumen - Paints - Tiles.</td>
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<th>UNIT II</th>
<th>BUILDING CONSTRUCTION</th>
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<td>Building elements - Planning - Types of buildings - Super structure - Substructure - Damp proofing.</td>
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<tr>
<th>UNIT III</th>
<th>SURVEYING</th>
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<td>Principles of surveying - Classification of surveying - Chain surveying - Compass surveying - Levelling - Theodolite - Total station - GIS - Remote sensing.</td>
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<th>DISASTER MANAGEMENT</th>
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<td>Types of disaster - Earthquake - Wind - Cyclone - Flood - Fire - Precautions to be taken -</td>
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</table>
Disaster management and planning.

**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

**TEXTBOOKS:**

**REFERENCES:**

**CO-PO-PSO MAPPING: BASIC CIVIL ENGINEERING**

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**GE3251** தமிழரும்மதொழில்நுட்பம்

| LT PC | 1 0 0 1 |

அலகு I வருமடையக்கரைக்கத்துணரம்: 3
 குறுக்கோடுகள் சிறுத்துறுத்துக்கோடு – பலபருண்டு குறுக்கோடு – குறுக்கோட்டினம் பலபருண்டு – பலபருண்டுகச் சுற்று கச்சை விளைவு.

அலகு II வேறுமடையக்கரைக்கத்துணரம்: 3
 குறுக்கோடுகள் குறுக்கோட்டினம் போக்கினம் காய்ப்பாறையின் & குறுக்கோடுகள் வேறென்பொருள்கள்
வீட்டும் பருட்களில் வடிவமாக கொண்ட கனவு முழுக்கள் - மென்மன் விளம்பமாக கொண்ட கனவு பருட்கள் - பார்வென்று விளம்பமாக, சிலப்பதிகொரத்தில் பெருக்கும் பொடுமையானது கனவு - முந்திய கனவு முழுக்கள் - முந்திய கனவு பருட்கள் - பார்வென்று கனவு முழுக்கள் - முந்திய கனவு பருட்கள் - பார்வென்று கனவு முழுக்கள் - முந்திய கனவு பருட்கள் - பார்வென்று கனவு முழுக்கள் - முந்திய கனவு பருட்கள்.
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

GE3251 TAMILS AND TECHNOLOGY

<table>
<thead>
<tr>
<th>UNIT I</th>
<th>WEAVING AND CERAMIC TECHNOLOGY</th>
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<td>Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.</td>
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<td>Designing and Structural construction House &amp; 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.</td>
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<th>UNIT V</th>
<th>SCIENTIFIC TAMIL &amp; TAMIL COMPUTING</th>
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TOTAL : 15 PERIODS

TEXT-CUM-REFERENCEBOOKS
1. தமிழ் பொடு - மகரணஸ் மலன் பொடு - நூல் (முயிர் பிள்மளப்பிடித்து மாநி பலட் சுந்தர). (மாநி பொடநூல் கற்று கல்லுற்று)
2. மதொல்லியீடு தமிழ் கீழடி - மவமகநதிக்கமுனர். (மவமகநதிக்கமுனர்)
3. தமிழ் யொன்று - தமிழ் யொன்று - தமிழ் யொன்று (மதொல்லியீடு தமிழ் யொன்று)
4. பாண்டியம் - அர்ஜுனம் மாவியம் (மாநி பொடநூல் கற்று கல்லுற்று)
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:
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)


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**NCC Credit Course Level 1**

NX3251 (ARMY WING) NCC Credit Course Level - I

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**TOTAL : 30 PERIODS**
NCC Credit Course Level 1*
NX3252  (NAVAL WING) NCC Credit Course Level – I  L T P C  2 0 0 2

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
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  L T P C  2 0 0 2

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
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  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

CY3161  CHEMISTRY LABORATORY  L T P C  0 0 2 1

(Minimum of 8 experiments to be conducted)

LIST OF EXPERIMENTS:
1. Estimation of HCl using Na$_2$CO$_3$ 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 -
- 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
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 EXCERISES
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

GROUP – B (MECHANICAL AND ELECTRONICS)

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

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**GE3261 ENGLISH LABORATORY – II**

**L T P C**

0 0 2 1

**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

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)

**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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- 1 - low, 2 - medium, 3 - high, "-" - no correlation

**Note:** The average value of this course to be used for program articulation matrix.