VISION:
To be a leader in textile and apparel technology education, research and innovation to benefit the society.

MISSION:
The mission of the Department of Textile Technology, Anna University is

- To maintain and upgrade the ambience that expands the frontiers of knowledge in textile, apparel and technical textiles.
- To develop the highest quality textile and apparel technologists with societal values.
- To carry out cutting-edge research and develop innovative technology for the benefit of society.
PROGRAM EDUCATIONAL OBJECTIVES (PEOs)
Bachelor of Textile Technology curriculum is designed to prepare the undergraduates to
I. Have appropriate knowledge, skill and attitude for the successful professional career with ethical values.
II. Have strong foundation in basic sciences, engineering, mathematics, computational knowledge and in-depth knowledge in apparel technology to pursue higher studies and research.
III. Foster critical thinking, creativity and collaborative skill to embark on innovation and entrepreneurship.

PROGRAM OUTCOMES (POs)

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<th>PO#</th>
<th>Graduate Attribute</th>
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<tbody>
<tr>
<td>1</td>
<td><strong>Engineering knowledge</strong>: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.</td>
</tr>
<tr>
<td>2</td>
<td><strong>Problem analysis</strong>: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.</td>
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<tr>
<td>3</td>
<td><strong>Design/development of solutions</strong>: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.</td>
</tr>
<tr>
<td>4</td>
<td><strong>Conduct investigations of complex problems</strong>: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.</td>
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<tr>
<td>5</td>
<td><strong>Modern tool usage</strong>: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.</td>
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<tr>
<td>6</td>
<td><strong>The engineer and society</strong>: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.</td>
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<tr>
<td>7</td>
<td><strong>Environment and sustainability</strong>: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.</td>
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<td>8</td>
<td><strong>Ethics</strong>: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.</td>
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<td>9</td>
<td><strong>Individual and team work</strong>: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.</td>
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<td>10</td>
<td><strong>Communication</strong>: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.</td>
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</table>
| 11  | **Project management and finance**: Demonstrate knowledge and understanding of the
engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12 **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PROGRAM SPECIFIC OUTCOMES (PSOs) - (3 statements )**

The Textile Technology Graduates will have the ability to
1. Pursue successful career in fashion, clothing designing and entrepreneurship.
2. Lead the apparel and allied industries.
3. Evaluate and develop new apparel products & processes.

**Mapping of Programme Educational Objective with Programme Outcomes**

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# ANNA UNIVERSITY: CHENNAI: 600 025
## UNIVERSITY DEPARTMENTS
### B.TECH. APPAREL TECHNOLOGY
#### REGULATIONS – 2023
##### CHOICE BASED CREDIT SYSTEM
###### CURRICULUM AND SYLLABI FOR SEMESTERS I AND II

## SEMESTER I

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*Skill Based Course

## SEMESTER II

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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.

4
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

Listening – Telephone conversation & Writing message, gap filling; Reading – Telephone message, bio-note; Writing – Personal profile; Grammar – Simple present tense, Present continuous tense, Asking questions (wh-questions); Vocabulary – One word substitution, Synonyms

UNIT II  NARRATION

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

UNIT III  DESCRIPTION

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

UNIT IV  CLASSIFICATION

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

UNIT V  EXPRESSION OF VIEWS

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

Assessment

Two Written Assessments: 35% weightage each
Assignment: 30% weightage
Designing a tourist brochure / Writing an opinion article / Making a travel podcast
End Semester Exam: 3-hour written exam

TOTAL : 45 PERIODS

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

**MA3151 MATRICES AND CALCULUS**

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### 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

- 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

- Limit, continuity, partial derivatives
- Homogeneous functions and Euler’s theorem
- Total derivative
- Differentiation of implicit functions
- Taylor's formula for two variables
- Errors and approximations
- Maxima and Minima of functions of two variables
- Lagrange's method of undermined multipliers.

### 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  (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
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.

TOTAL: 45 PERIODS
CO5: Understand the significance of crystal physics.

TEXT BOOKS:

REFERENCES:

CO-PO & PSO MAPPING

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• 1’ = Low; ‘2’ = Medium; ‘3’ = High

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

Engineering Plastics: Polyamides, Polycarbonates and Polyurethanes. Compounding and Fabrication Techniques: Injection, Extrusion, Blow and Calendaring
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

COURSE OUTCOMES:
- To recognize and apply basic knowledge on different types of polymeric materials, their general preparation methods and applications to futuristic material fabrication needs.
- To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
- To recognize and apply basic knowledge on suitable corrosion protection technique for practical problems.
- To recognize different storage devices and apply them for suitable applications in energy sectors.
- 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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**EE3151 ** BASICs of Electrical and Electronics Engineering  L T P C  3 0 2 4

**UNIT – I ELECTRICAL CIRCUITS**  9

**UNIT – II ELECTRICAL MACHINES**  9

**UNIT – III ANALOG AND DIGITAL ELECTRONICS**  9
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**  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

**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:
அக்கனவே - தமிழரின் மரபு தொகுதி 3
 சிங்கராய் செயலியாளர் - சிங்கராய் செயலியாளர் - தமிழ் மற்றும் இலக்கியம் - சிங்கராய் செயலியாளர் - தமிழ் மற்றும் இலக்கியம் - சிங்கராய் செயலியாளர் - தமிழ் மற்றும் இலக்கியம் - சிங்கராய் செயலியாளர் - தமிழ் மற்றும் இலக்கியம் - சிங்கராய் செயலியாளர் - தமிழ் மற்றும் இலக்கியம் - சிங்கராய் செயலியாளர்.

அக்கனவே - பாடல் சிறியமுறை தமிழ் சிறியமுறை மகாகத்தில் கருதப்படும் கலாஞ்சிகள்: 3
 கருத்துக்கோர, கைகள், நீர்ப்பொட்டிகள், கையாட்சிகள் குழப்பு, கருவிகள், மேல்பொட்டுகள், சிறியமுறை தமிழில் விளக்கம்.

அக்கனவே - சிறியமுறை சில கட்டுடைந்தவங்கள்: 3
 தமிழ்முறை சில கட்டுடைந்தவங்கள் - வெளியில் சில கட்டுடைந்தவங்கள் - சில கட்டுடைந்தவங்கள் - வெளியில் சில கட்டுடைந்தவங்கள் - சில கட்டுடைந்தவங்கள்.

அக்கனவே - சிறியமுறை சிறியமுறை நோய்வகத்தில் சில கட்டுடைந்தவங்கள்: 3
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TOTAL : 15 PERIODS

TEXT-CUM-REFERENCEBOOKS
1. தமிழ் முறைகள் - பாணதி பாசுடை - தமிழ் பிரிவு (நூற்பிள்ளை)
2. தமிழ் முறைகள் - பாணதி பாசுடை (பிரிவு பிள்ளை)
3. தமிழ் முறைகள் - பாணதி பிரிவு (நூற்பிள்ளை பிள்ளை)
4. பாணதி பாசுடை (பிரிவு பிள்ளை)
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.Valarmathth) (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)

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-REFERENCE BOOKS

1. Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India
2. Self-Respect Movement
3. Role of Siddha Medicine in Indigenous Systems of Medicine
4. Inscriptions & Manuscripts
5. Print History of Tamil Books

CALCULATION

CY3161 CHEMISTRY LABORATORY

(Minimum of 8 experiments to be conducted)

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

**TOTAL: 30 PERIODS**

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

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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** 15

**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 EXCERSES**
- 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 15  
   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 15  
   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  

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GE3162 ENGLISH LABORATORY – I  
L T P C 0 0 2 1  
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)  
Ex.: First day in college / vacation / first achievement etc.
UNIT III CONVERSATION
Making conversation – formal and informal – Turn taking and Turn giving – Small talk

UNIT IV SHORT SPEECH
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
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 L T P C 3 0 0 3

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

Learning Outcomes

On completion of the course, the students will be able to:
• Listen effectively to various oral forms of conversation, lectures, discussion and understand the main gist of the content.
• Communicate effectively in formal and informal context.
• Read and comprehend technical texts effortlessly.
• Write reports and job application for internship or placement.
• 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

CO-PO & PSO MAPPING

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- 1-low, 2-medium, 3-high, ‘-’= no correlation
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) – Parseval’s identity.

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

TOTAL: 60 PERIODS

COURSE OUTCOMES:
At the end of the course, the students will be able to:
CO1: Solve higher order ordinary differential equations which arise in engineering applications.
CO2: Apply Laplace transform techniques in solving linear differential equations.
CO3: Apply Fourier series techniques in engineering applications.
CO4: Understand the Fourier transforms techniques in solving engineering problems.
CO5: Understand the Z-transforms techniques in solving difference equations.

TEXT BOOKS:

REFERENCES:

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AS3251 CHEMISTRY FOR TECHNOLOGISTS

COURSE OBJECTIVE
The students will be imparted the knowledge on Boiler feed water requirements, water treatment techniques, Applications of oil and its properties, principles of different chemical analysis and students also be provided with the knowledge on important dyes and their applications, they will be taught to prepare bleaching powder, sodium hypochlorite and hydrogen peroxide for the bleaching of fabrics in industries.

UNIT I WATERTECHNOLOGY

UNIT II OILS,FATS,SOAPS & LUBRICANTS
Chemical constitution, chemical analysis of oils and fats – free acid, saponification and iodine values, definitions, determinations and significance. Soaps and detergents – cleaning action of soap. Lubricants - definition, characteristics, types and properties – viscosity, viscosity index, carbon residue, oxidation stability, flash and fire points, cloud and pour points, aniline point. Solid lubricants – graphite and molybdenum disulphide.

UNIT III CHEMICAL ANALYSIS – AN ANALYTICAL INSIGHT

UNIT IV DYE CHEMISTRY
Witt’s theory and modern theory of colors – synthesis of methyl red, methyl orange, congo red, malachite green, p-rosaniline, phenolphthalein, fluorescence, eosin dyes.

21
UNIT V  CHEMICALS AND AUXILIARIES

TOTAL: 45 PERIODS

COURSE OUTCOME
After completion of this course, the student is expected to
CO1. Analyze the boiler feed water and assess the method of purification techniques.
CO2 Classify oil, fat and soap and its properties and gain the knowledge about lubricants
CO3. Understand the principles of different chemical analysis and to estimate the amount of nitrogen and aniline
CO4. Classify the dyes and to prepare various dyes used in textile industries.
CO5. Explain and prepare the chemical auxiliaries required for dyeing

TEXT BOOKS

REFERENCE BOOKS

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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GE3155           ENGINEERING DRAWING          L T P C
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COURSE OBJECTIVES:
The learning objectives of this course is to develop in students, the engineering graphic skills for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings.

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         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:

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

AT3201 DESIGN THINKING

<table>
<thead>
<tr>
<th>Course Objectives</th>
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<tr>
<td><strong>COURSE OBJECTIVES</strong></td>
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<td>To enable the students to use design thinking approaches for solving problems</td>
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**UNIT I INTRODUCTION TO DESIGN THINKING**
Understanding design thinking, design thinking as problem solving tools, design Thinking for need identification and product specification; basic rules of design thinking; double diamond and abstract tangible cycle

**UNIT II DESIGN THINKING APPROACHES**
Empathy, ethnography, divergent thinking, convergent thinking, visual thinking, assumption thinking, prototyping,

**UNIT III RESEARCH AND IDEA GENERATION**
Design thinking process stages – define, research, ideate, prototype, select, implement, learn. Research and idea generation: Research – identifying drivers, information gathering, target groups; Idea Generation: Basic design directions, themes of thinking, inspiration and references, brainstorming, value, inclusion, sketching, presentation ideas.

**UNIT IV REFINEMENT, PROTOTYPING AND IMPLEMENTATION**
Thinking in images, thinking in signs, appropriation, humor, personification, visual metaphors, modification, thinking in words, words and language, type ‘faces’, thinking in shapes, thinking in proportions, thinking in colour; Prototyping - Developing designs, types of prototype. Implementation – format, materials, finishing, media, scale, series, continuity.

**UNIT V DESIGN THINKING TOOLS AND METHODS**
Visualization, journey mapping, value chain analysis, mind mapping, brainstorming, concept development, assumption testing, rapid prototyping, design thinking application

**TOTAL: 45 PERIODS**

**OUTCOMES:**
Upon completion of this course, the student shall be able to understand
- CO 1 –understand the need for the design thinking and implement the rules of design thinking in problem solving process
- CO 2 –analyse and implement the design thinking approaches
- CO 3 –identify an idea and analyse the various information related to that idea for design development
- CO 4 –Analyse the problem and develop a prototype by analysing the implications in implementation
CO 5 – comprehend and implement the design thinking tools in problem solving process

TEXTBOOKS:

REFERENCES:
அலகு III உற்பத்தித்மதொழில்நுட்பம்: 3
கம்பேடு களிம கல் - விளக்கச் சுருக்கம் - தின்மை கதவுகள், கச்சை - வாருகர் த்ராயானைச் சீர்ப்பு மற்றும் திகசரம் முறைகள் - முருகை அடையாளத் தொழில்நுட்பத்தில் - தொட்டியல் வழங்கியக் காரணிகள் - குறைமுறை பலடக்கிகள் - குளிர் தொழிகள் - டூரிப்புத்துறைகள் - கையடிப்பு தொழிகள் - திக்கலக்கள் பலகைப்புகள்.

அலகு IV கவளொை ் றமமற்றும் நீர்ப்பொசனத்மதொழில்நுட்பம்: 3
அுயா, மூக்கு, மங்கள் - தின்மைகள் குறிப்பிட்டு மாறிகள் பதவிக்கிறோம் - கான்மன பொருளோரின் - காண்டைகளால் குறிப்பிட்டல் மூலம் தொழில்நுட்பம் கையாண்டு அசைப்புகள் - கல்லாக அறிவு - பொருளளவு - முக்கியமான முறைகள் - வழிநீர் குறிப்பிட்டு பதவிக்கிறோம் - திக்கலக்கள் பலகைப்புகள்.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCEBOOKS
1. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2. Social Life of the Tamils – The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
3. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
4. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies).
5. 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)
6. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
7. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Bookand 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  

UNIT III  MANUFACTURING TECHNOLOGY  

UNIT IV  AGRICULTURE AND IRRIGATION TECHNOLOGY  

UNIT V  SCIENTIFIC TAMIL & TAMIL COMPUTING  

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCEBOOKS
1. கொல்லியல் எவுரோமாைல் – எண்கமல்லத் தமிழ்ப் பதிப்பு (தமிழ்: பொல்லியல் எவுரோமாைல் எழுத்திய கல்லால் பதிப்பியல் கல்லால்).
2. கழியி ரூது – புலியல் தமிழ்ப் பதிப்பு (தமிழ்: பிரொமோய் பதிப்பு).
3. புராணம் – சோபாலை என்னைக்குத் தமிழ் தொகுத்திகள் தமிழ் தொகுத்திகள் (தமிழ்: பிரொமோய் பதிப்பு).
4. பொறுக்கும் – ஓர்கொல்லியல் தொகுத்திகள். (தமிழ்: பிரொமோய் பதிப்பு)
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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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
NX3251  (ARMY 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
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 2
   Problem Solving
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 2 Protection of Children and Women Safety 1
SS 3 Road / Rail Travel Safety 1
SS 4 New Initiatives 2
SS 5 Cyber and Mobile Security Awareness 1

TOTAL : 30 PERIODS

NX3252  (NAVAL WING) NCC Credit Course Level - I  L  T  P  C
                2  0  0  2

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
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*
NX3253 (AIR FORCE WING) NCC Credit Course Level – I  L  T  P  C

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
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
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. Uniform bending – Determination of Young’s modulus of the material of the beam.
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.
10. a) Optical fibre - Determination of Numerical Aperture and acceptance angle.
    b) - Determination of bending loss of fibre.
12. Michelson Interferometer - Determination of wavelength of the monochromatic source of light.
13. Photoelectric effect – Determination of Planck’s constant.
15. Mende’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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GE3261 ENGLISH LABORATORY – II

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

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

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

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

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

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

TOTAL : 30 PERIODS

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

CO-PO & PSO MAPPING

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