VISION
The Department of Instrumentation Engineering perseveres in becoming a Centre for Excellence in Electronics, Instrumentation, Process Control & Information Technology for Higher level learning, Research & Consultancy and aims at imparting high quality education to students and professionals leading them towards global competence to become a preferred partner of the industry and community for providing Engineering solutions.

MISSION
a) Provide the students with strong foundation in Electronics, Instrumentation and Control Engineering.
b) Enhance the core competency of the students to cater to the needs of the industries and research organizations.
c) Update the curriculum periodically and to upgrade the laboratories with state-of-art equipment.
d) Encourage faculty members to keep abreast of current trends through continuing educational programs.
e) Carry out interdisciplinary research and consultancy in the cutting-edge technology.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):
Bachelor of Electronics and Instrumentation Engineering curriculum is designed to prepare the graduates to acquire knowledge, skills and attitudes in order to:

PEO1: Be successful in their technical, professional careers & in their chosen fields such as Electronics, Instrumentation, Process Control & Information Technology.

PEO2: Engross in the life long process of learning to keep themselves abreast of new developments in the emerging areas of Electronics, Instrumentation, Process Control & Information Technology.

PEO3: Start their own company or nurture innovative ideas and creativity in their workplace.

PEO4: Uphold the highest integrity and social responsibility in all their endeavors.

PEO5: Exhibit leadership and inter-personal skills.
PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of their formation to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs):

After completion of Electronics and Instrumentation Engineering program, students will gain core competency skills in domains such as Electronics, Instrumentation and Process control and

PSO1: Be able to Select, install, calibrate and maintain instruments used for measurement and analysis and interpret the data obtained to arrive at a significant conclusion.

PSO2: Be able to analyze, design and develop signal conditioning circuits for sensors, actuators and select a suitable Embedded System for realizing various control schemes and
smart instruments.

**PSO3:** Be able to design, develop and implement control schemes for various industrial processes and gain hands-on experience in configuring Industrial Automation System such as PLC and DCS.

**PEO/PO Mapping:**

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Note: Correlation - ‘1’ = Low; ‘2’ = Medium; ‘3’ = High; ‘-’ = Nil
# B.E. Electronics and Instrumentation Engineering

## Regulations - 2023

### Curriculum and Syllabi for Semesters I and II

#### Semester I

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| 7.     | PH3161      | Physics Laboratory                    | BSC       | 0 | 0 | 2 | 2 | 1 |         |
| 8.     | GE3162      | English Laboratory - III              | EEC       | 0 | 0 | 2 | 2 | 1 |         |

**TOTAL** | 15 | 1 | 8 | 24 | 20 |        |

$ Skill Based Course

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| **PRACTICALS** |             |                                       |           | 2 | 0 | 2 | 2 | 1 |         |
| 8.     | GE3161      | Engineering Practices Laboratory     | ESC       | 0 | 0 | 4 | 4 | 2 |         |
| 9.     | CY3161      | Chemistry Laboratory                 | BSC       | 0 | 0 | 2 | 2 | 1 |         |
| 10.    | GE3261      | English Laboratory - II*              | EEC       | 0 | 0 | 2 | 2 | 1 |         |

**TOTAL** | 15 | 2 | 12 | 29 | 23 |        |

$ Skill Based Course

# NCC Credit Course level 1 is offered for NCC students only. 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
SEMESTER I

HS3151 ENGLISH FOR COMMUNICATION – I L T P C 3 0 0 3

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 Engineers and Technologists” Volume I by Orient Blackswan, 2022

REFERENCES
4. www.uefap.com

MAPPING OF COs WITH POs AND PSOs

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- 1-low, 2-medium, 3-high
UNIT I  MATRICES  
(9+3)
Eigen values and Eigen vectors of a real matrix – Properties of Eigen values - Cayley-Hamilton theorem (excluding proof) – Diagonalization of matrices - Reduction of Quadratic form to canonical form by using orthogonal transformation - Nature of a Quadratic form.

UNIT II  FUNCTIONS OF SEVERAL VARIABLES  
(9+3)

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

UNIT IV  MULTIPLE INTEGRALS  
(9+3)

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

TOTAL: 60 PERIODS

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

TEXT BOOKS:
REFERENCES:

MAPPING OF COs WITH POs AND PSOs

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- 1’ = Low; ‘2’ = Medium; ‘3’ = High
UNIT I MECHANICS OF MATERIALS 9

UNIT II OSCILLATIONS, SOUND AND THERMAL PHYSICS 9

UNIT III OPTICS AND LASERS 9

UNIT IV QUANTUM MECHANICS 9

UNIT V CRYSTAL PHYSICS 9

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:

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- 1’ = Low; ‘2’ = Medium; ‘3’ = High
UNIT I POLYMER CHEMISTRY
Engineering Plastics: Polyamides, Polycarbonates and Polyurethanes. Compounding and Fabrication Techniques: Injection, Extrusion, Blow and Calendaring

UNIT II NANO CHEMISTRY

UNIT III CORROSION SCIENCE

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

UNIT V WATER TECHNOLOGY

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:

REFERENCES:

MAPPING OF Cos WITH POs AND PSOs

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- 1’ = Low; ‘2’ = Medium; ‘3’ = High
UNIT I  BASICS OF C PROGRAMMING  6+12
Introduction to programming paradigms — Structure of C program - C programming: Data Types - Constants - Keywords - Operators: Precedence and Associativity - Expressions - Input/Output statements, Assignment statements - Decision making statements - Switch statement.

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

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

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

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

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

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

PRACTICALS:
- Programs using Structures
- Programs using Unions
- Programs using pointers to structures and self-referential structures
UNIT V  MACROS AND FILE PROCESSING  6+12

PRACTICALS:
- Programs using pre-processor directives & macros
- Programs to handle file operations
- Programs to handle file with structure

COURSE OUTCOMES:
Upon completion of the course, the students will be able to
CO1: Write simple C programs using basic constructs.
CO2: Design searching and sorting algorithms using arrays and strings.
CO3: Implement modular applications using Functions and pointers.
CO4: Develop and execute applications using structures and Unions.
CO5: Solve real world problem using files.

TOTAL PERIODS: 90 (30+60)

TEXT BOOKS:

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1' = Low; '2' = Medium; '3' = High
அம்மி I  புத்தகங்கள் சித்தைத்தமிழ்: 3
தொன்மையற் கருத்துக்கள் - நீரில் புத்தகங்கள் - தமிழ் மொழியான புத்தகங்கள் - தமிழ்மொழியான புத்தகங்கள் - தமிழ் மொழி புத்தகங்கள் - தமிழ் மொழி புத்தகங்கள் - தமிழ் மொழி புத்தகங்கள் - தமிழ் மொழி புத்தகங்கள். அரசியல் பதிப்பு மன்னர் புத்தகங்கள் – தமிழ்மொழியான புத்தகங்கள் - தமிழ் மொழி புத்தகங்கள் பார்வையான புத்தகங்கள் அதிமுகற்பிள்ளையானப்

அம்மி II  மருத்துவ முறைமைகள் பதிவு தொன்மை திருப்பிள்ளை - சித்தைத்தமிழ்: 3
தொன்மையற் கருத்துக்கள் - நீரில் புத்தகங்கள் - தமிழ் மொழியான புத்தகங்கள் - தமிழ் மொழியான புத்தகங்கள் - தமிழ் மொழி புத்தகங்கள் - தமிழ் மொழி புத்தகங்கள் - தமிழ் மொழி புத்தகங்கள் - தமிழ் மொழி புத்தகங்கள். அரசியல் பதிப்பு மன்னர் புத்தகங்கள் – தமிழ்மொழியான புத்தகங்கள் - தமிழ் மொழி புத்தகங்கள்

அம்மி III  கல்வியியல் குழுக்களுக்கு எண் விளக்கப்பட்டதை: 3
கல்வியியல், கல்வியியல், சிற்பங்கள், சிற்பங்கள், சிற்பங்கள், சிற்பங்கள், சிற்பங்கள், சிற்பங்கள்

அம்மி IV  தில்லிகள் திருநூற்றாண்டு திறன்: 3
தில்லிகள் திருநூற்றாண்டு, சிற்பங்கள் - புத்தகங்கள் மூன்றாண்டு சான் தில்லிகளில் அம் மூன்றாண்டு புத்தகங்களில் - தில்லிகள் புத்தகங்களில் அம் மூன்றாண்டு சான் கல்வியியல் - சிற்பங்கள், சிற்பங்கள், சிற்பங்கள், சிற்பங்கள், சிற்பங்கள், சிற்பங்கள், சிற்பங்கள்

அம்மி V  தில்லிகள் திருநூற்றாண்டு மூன்றாண்டு திறன் புத்தகங்களில் புத்தகங்களில் புத்தகங்களில்: 3
தில்லிகள் புத்தகங்களில் புத்தகங்களில் புத்தகங்களில் புத்தகங்களில் புத்தகங்களில் புத்தகங்களில் புத்தகங்களில் புத்தகங்களில் - தில்லிகள் புத்தகங்களில் புத்தகங்களில் - தில்லிகள் புத்தகங்களில் - தில்லிகள்

TEXT-CUM-REFERENCE BOOKS
1. சிற்பங்கள் புத்தகங்கள் - புத்தகங்கள் புத்தகங்கள் - புத்தகங்கள் புத்தகங்கள் (தமிழ்: கல்லறை புத்தகங்கள் மூன்றாண்டு சான் சிற்பங்களில் புத்தகங்களில்)
2. சிற்பங்கள் புத்தகங்கள் - புத்தகங்கள் புத்தகங்கள் (தமிழ்: புத்தகங்கள் சிற்பங்களில்)
3. சிற்பங்கள் - புத்தகங்கள் புத்தகங்கள் சிற்பங்களில் புத்தகங்களில் (தமிழ்: புத்தகங்கள் சிற்பங்களில்)

TOTAL : 15 PERIODS
4. பாலநாது – அரேப்பாமல் திருக்குறிக்க. (பதிப்புச் செய்து வெளிப்படுத்தப்பட்டுள்ளது)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils – The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies.)
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. Keeladi – ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

GE3154 HERITAGE OF TAMILS L T P C 1 0 0 1

UNIT I LANGUAGE AND LITERATURE

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

UNIT III FOLK AND MARTIAL ARTS

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

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

TOTAL : 15 PERIODS
TEXT-CUM-REFERENCE BOOKS

1. தமிழக வரலொறு – மக்களும் பண்பொடும் – 5ஆ. வளர்த்தல (முதலில்: தமிழ்நூற்றாண்டு பல்கலைக் கழகம் கல்விப் பதிப்புக்கு).

2. கணினித் தமிழ் – முமனவர் இல சுந்தரம். (விகடன் பிரசுரம்).

3. தில்லி – தன்னால் சிற்றிககையாக சாதுகல் செய்த நகரிகள் (ததொல்லியல் துறை தவளியீடு).


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

Any SEVEN Experiments

1. Torsional Pendulum – Determination of rigidity modulus of wire and moment of inertia of the disc.
2. Non-uniform bending – Determination of Young’s modulus of the material of the beam.
3. Uniform bending – Determination of Young’s modulus of the material of the beam.
5. Viscosity of Liquids.
7. Ultrasonic interferometer – determination of sound velocity and liquids compressibility.
   - Determination of the width of the groove of the compact disc using laser.
   - Estimation of laser parameters.
    b) Determination of bending loss of fibre.
13. Photoelectric effect – Determination of Planck’s constant.
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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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

MAPPING OF Cos WITH POs AND PSOs

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- 1-low, 2-medium, 3-high
SEMESTER II

HS3251  ENGLISH FOR COMMUNICATION – II  L T P C  3 0 0 3

UNIT I  CAUSE AND EFFECT  9
Listening – Radio / TV / Podcast Interview (survivors tale) and framing a set of instructions/ Do’s and Don’ts; Reading – Excerpts of Literature (short stories), Journal articles on issues like Global warming; Writing – Instructions; Official letter / email (Request for internship / Industrial visit); Grammar – If conditionals, Imperatives; Vocabulary – Cause and effect expressions, Idiom

UNIT II  COMPARE AND CONTRAST  9
Listening – Product reviews and gap fill exercises, Short Talks (like TED Talks) for specific information; Reading – Graphical content (table / chart / graph) and making inferences; Writing – Compare and Contrast Essay; Grammar – Degrees of Comparison; Mixed Tenses; Vocabulary – Order of Adjectives, Transition words.

UNIT III  PROBLEM AND SOLUTION  9
Listening – Group discussion (case study); Reading – Visual content (Pictures on social issues / natural disasters) for comprehension; Editorial; Writing Picture description; Problem and Solution Essay; Grammar – Modal verbs; Relative pronoun; Vocabulary – Negative prefixes, Signal words for problem and solution.

UNIT IV  REPORTING  9
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  9
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**
1. “English for Engineers and Technologists” Volume 2 by Orient Blackswan, 2022

**REFERENCES**
4. www.uefap.com

### MAPPING OF CoS WITH POs AND PSOs

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1-low, 2-medium, 3-high
UNIT I  ORDINARY DIFFERENTIAL EQUATIONS  (9+3)
Homogeneous linear ordinary differential equations of second order, linearity principle, general
solution- Particular integral – Operator method – Solution by variation of parameters – Method of
undetermined coefficients – Homogenous equations of Euler–Cauchy and Legendre’s type – System
of simultaneous linear differential equations with constant coefficients.

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

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

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

UNIT V  Z–TRANSFORM AND DIFFERENCE EQUATIONS  (9+3)
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 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:
PH3251  PHYSICS FOR ELECTRICAL SCIENCES  LT P C  3 0 0 3

UNIT I  ELECTRICAL PROPERTIES OF MATERIALS  9

UNIT II  SEMICONDUCTORS AND TRANSPORT PHYSICS  9

UNIT III  DIELECTRIC AND MAGNETIC PROPERTIES OF MATERIALS  9

UNIT V  OPTICAL PROPERTIES OF MATERIALS  9
UNIT V     NANODEVICES


TOTAL: 45 PERIODS

COURSE OUTCOMES:
After completing the above subject, students will have
CO1: Knowledge of the electrical properties of materials
CO2: Acquire an adequate understanding of semiconductor physics and the functioning of semiconductor devices
CO3: Come to have firm knowledge of the dielectric and magnetic properties of materials and their applications
CO4: Understand the optical properties of materials and working principles of various optical devices
CO5: Appreciate the importance of nanotechnology, the physics of nanodevices, low-dimensional structures and their applications

REFERENCES

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- 1-low, 2-medium, 3-high
UNIT I  STATICS OF PARTICLES  

UNIT II  EQUILIBRIUM OF RIGID BODIES AND TRUSSES  

UNIT III  DISTRIBUTED FORCES  
Centroids of lines and areas – symmetrical and unsymmetrical shapes, Determination of Centroids by Integration, Theorems of Pappus-Guldinus, Distributed Loads on Beams, Centre of Gravity of a Three-Dimensional Body, Centroid of a Volume, Composite Bodies, Determination of Centroids of Volumes by Integration. Moments of Inertia of Areas and Mass - Determination of the Moment of Inertia of an Area by Integration, Polar Moment of Inertia, Radius of Gyration of an Area, Parallel-Axis Theorem, Moments of Inertia of Composite Areas, Moments of Inertia of a Mass - Moments of Inertia of Thin Plates, Determination of the Moment of Inertia of a Three-Dimensional Body by Integration.

UNIT IV  FRICTION AND WORK PRINCIPLES  

UNIT V  DYNAMICS OF PARTICLES AND RIGID BODIES  

TOTAL : 60 PERIODS

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

CO1 To determine the resultant forces acting on a particle in 2D and 3D and to apply methods of equilibrium on a particle in 2D and 3D.

CO2 Evaluate the reaction forces for bodies under equilibrium, to determine moment of a force, moment of a couple, to resolve force into a force-couple system and to analyze trusses.

CO3 Assess the centroids of 2D sections / center of gravity of volumes and to calculate area moments of inertia for the sections and mass moment of inertia of solids.

CO4 Evaluate the frictional forces acting at the contact surfaces of various engineering systems and apply the work-energy principles on a particle. evaluate the kinetic and kinematic parameters of a particle.
**CO5** Determine kinetic and kinematic parameters of the rigid bodies subjected to concurrent coplanar forces.

**TEXTBOOKS:**

**REFERENCES:**

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CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION) 2
Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I  PLANE CURVES 4 + 12
Basic Geometrical constructions, Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola by eccentricity method — Construction of cycloid — construction of involutes of square and circle — Drawing of tangents and normal to the above curves.

UNIT II  PROJECTION OF POINTS, LINES AND PLANE SURFACE 6 + 12
Orthographic projection- Principal planes – First angle projection – projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes – Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

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

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

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

TOTAL : 90 PERIODS

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

TEXTBOOKS:

REFERENCES:

Publication of Bureau of Indian Standards:

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
அலகு I  தமிழக மக்களும் பணமும் அதிகாரியாகப் 3 குறிப்பிட்டும் உள்ளது - பல்வேறு மதொழிவாகப் - கொண்டு இம்மாப் பாணத்துச் செயல்களின் நேரத்தில் தரிசிக்கப்பட்டது.

அலகு II  குழுவாகப் பானும் குழுவும் அதிகாரியாகப் 3 குறிப்பிட்டும் உள்ளது - பல்வேறு மதொழிவாகப் - கொண்டு இம்மாப் பாணத்துச் செயல்களின் நேரத்தில் தரிசிக்கப்பட்டது.

அலகு III கல்வியியல் குறிப்பிட்டும் அதிகாரியாகப் 3 குறிப்பிட்டும் உள்ளது - கணினித் தமிழ் - முமனவர் இல.சுந்தரம். (விகடன் பிரசுரம்).

அலகு IV  செயல்வாய்ந்த சிற்பமக்கர் சிற்பத்தில் அதிகாரியாகப் 3 குறிப்பிட்டும் உள்ளது - தமிழ் முதல் பாணத்துச் செயல்களின் நேரத்தில் தரிசிக்கப்பட்டது.

அலகு V  அறிவியல் சிற்பமக்கர் அதிகாரியாகப் 3 குறிப்பிட்டும் உள்ளது - அறிவியல் சிற்பமக்கர் சிற்பத்தில் அதிகாரியாகப் - தமிழ் முதல் பாணத்துச் செயல்களின் நேரத்தில் தரிசிக்கப்பட்டது.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS
1. தமிழ் வரலாறு – மாதிரி பாணத்து – தொ.தொ. பி.பி. பிரசுரம் (விகடன்: தமிழ் வரலாறு பாணத்து மதிக்காணாம்)
2. கல்வியியல் சிற்பமக்கர் – மாதிரி பாணத்து – தொ.தொ. பி.பி. பிரசுரம்
3. விழாக் குடியியகுதியில் பாணத்துச் செயல்கள் இயற்கை தொழில்முறை (தமிழ் வரலாறு தொ.தொ. பி.பி.)
4. பாணத்து – அறிவியல் சிற்பமக்கர். (தமிழ் வரலாறு தொ.தொ. பி.பி.)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils – The Classical Period (Dr.S.Singaravelu) (Published by: International
Institute of Tamil Studies.

7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).

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

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

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

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


GE3251 TAMILS AND TECHNOLOGY LT P C 1 0 0 1

UNIT I WEAVING AND CERAMIC TECHNOLOGY 3
Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.

UNIT II DESIGN AND CONSTRUCTION TECHNOLOGY 3

UNIT III MANUFACTURING TECHNOLOGY 3

UNIT IV AGRICULTURE AND IRRIGATION TECHNOLOGY 3

UNIT V SCIENTIFIC TAMIL & TAMIL COMPUTING 3

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

1. தமிழக வரலொறு – மக்களும் பண் பொடும் – மக, மக, பிள்மள (தவளியீடு: தமிழ்நொடு பொடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கேலடிக் கீழடி (தவளியீடு: தமிழ்நொடு பொடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
3. ग्रानुक आर्थिक जीवन और उद्योग – (शास्त्रीय प्रकाशन).
4. ग्रानुक आर्थिक जीवन और उद्योग – (शास्त्रीय प्रकाशन).
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NCC Credit Course Level 1*

NX3251 (ARMY WING) NCC Credit Course Level - I

NCC GENERAL

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

TOTAL : 30 PERIODS

NATIONAL INTEGRATION AND AWARENESS

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

PERSONALITY DEVELOPMENT

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

LEADERSHIP

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

SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

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

TOTAL : 30 PERIODS
NCC Credit Course Level 1*

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

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NATIONAL INTEGRATION AND AWARENESS

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LEADERSHIP

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SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

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TOTAL : 30 PERIODS
# NCC Credit Course Level 1*

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

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## NATIONAL INTEGRATION AND AWARENESS

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## LEADERSHIP

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## SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

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<td>SS 6</td>
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<td>SS 7</td>
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**TOTAL : 30 PERIODS**
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 EXCERCISES
   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:**

CO1: Ability to make common joints in carpentry and pipe connections with fittings used in plumbing works.

CO2: Ability to do electrical wiring for household applications.

CO3: Ability to weld the steel the structures and soldering of electronical connections and testing of PCBs

### MAPPING OF Cos WITH POs AND PSOs

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*1-low, 2-medium, 3-high*
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 –
CO1: analyse the water quality parameters for domestic and industrial purposes.
CO2: determine the amount of metal ions by spectroscopic techniques.
CO3: select a suitable polymer for industrial applications.
CO4: quantitatively analyse the impurities in solution by electroanalytical techniques.
CO5: predict the choice of metals for industrial purposes using corrosion studies.

TEXTBOOKS:

MAPPING OF COs WITH POs AND PSOs

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• 1-low, 2-medium, 3-high
UNIT I  INTERVIEW IN SOCIAL CONTEXT  6
Asking questions and answering - Conducting an interview (of an achiever / survivor) – Role play

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

UNIT III  CASE STUDY  6
Discussions on Case Study to find solutions for problems in professional contexts – Analytical discussion on various aspects of a given problem.

UNIT IV  VISUAL INTERPRETATION  6
Describing visual content (Pictures/Table/Chart) using appropriate descriptive language and making appropriate inferences and giving recommendations.

UNIT V  PRESENTATION  6
Making presentation with visual component (PPT slides) (job interview / project / innovative product presentation)

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

TOTAL : 30 PERIODS

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

MAPPING OF COs WITH POs AND PSOs

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