# Vision and Mission of the Department

**Vision of the Department**

The Department of Applied Science and Technology will achieve worldwide recognition for exceptional academic standards and cutting-edge research in the fields of oil and natural gas exploration, petrochemical production and safety management systems.

<table>
<thead>
<tr>
<th>Mission of the Department</th>
<th>Mission No</th>
<th>Mission Statements</th>
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</thead>
<tbody>
<tr>
<td>M1</td>
<td></td>
<td>Foster capable professionals in the upstream, midstream, and downstream sectors of the petroleum industry, as well as in occupational safety, health, and environment management, through quality teaching, research, and service</td>
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<tr>
<td>M2</td>
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<td>Develop core competency by encouraging students to think creatively, identify industry challenges, and construct innovative solutions.</td>
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<tr>
<td>M3</td>
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<td>Cultivate innovative thinking and entrepreneurial skills in the realm of cutting-edge technology.</td>
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</table>
PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):
The Bachelor of Petroleum Engineering and Technology curriculum is designed to prepare undergraduates to
1. Exhibit a strong technical proficiency in the planning, exploration, drilling, production, transportation and storage of oil and gas.
2. Equip students with comprehensive understanding of the technical, operational, modeling and economic aspects of refinery offsite operations.
3. Take leadership roles and actively engage in multidisciplinary teams, demonstrating professional and ethical attitudes to effectively accomplish objectives.
4. Foster a culture of continuous learning and training, embracing changes and advancements in the oil and gas industry to enhance the expertise of professionals.

PROGRAMME OUTCOMES (POs):
After going through the four years of study, our Petroleum Engineering and Technology Graduates will exhibit ability to:

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<th>Graduate attribute</th>
<th>Programme Outcome</th>
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<tbody>
<tr>
<td>PO1 Engineering Knowledge</td>
<td>Apply knowledge of mathematics, basic science and engineering fundamentals to real-world problems.</td>
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<tr>
<td>PO 2 Problem analysis</td>
<td>Identify, formulate and analyze complex engineering problems in the oil/gas industry.</td>
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<tr>
<td>PO 3 Design / development of solutions</td>
<td>Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the health, safety and environment at work place.</td>
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<tr>
<td>PO 4 Conduct investigations of complex problems</td>
<td>Conduct experiments &amp; collect, analyze and interpret the data.</td>
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<td>PO 5 Modern tool usage</td>
<td>Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities.</td>
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<tr>
<td>PO 6 The Engineer and society</td>
<td>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>PO 7 Environment and sustainability</td>
<td>Design the process with environment consciousness and circular economy for sustainable development.</td>
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<td>PO 8 Ethics</td>
<td>Apply ethical principles and commit to the standard of professional to practice behavior.</td>
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<tr>
<td>PO 9 Individual and team work</td>
<td>Function effectively as an individual, member or leader in diverse teams, to accomplish all spheres of life- interpersonal, social and professional.</td>
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<tr>
<td>PO10 Communication</td>
<td>Communicate effectively on complex engineering activities with the engineering community both in</td>
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verbal and non-verbal forms.

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<th>PO 11</th>
<th>Project management and finance</th>
<th>Implement cost effective and developing the design to meet specific success criteria at this specified time.</th>
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<td>PO 12</td>
<td>Life-long learning</td>
<td>Continue professional development and learning as a life-long activity with the aim of improving knowledge, skill and quality of life.</td>
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</table>

PROGRAMME SPECIFIC OUTCOMES (PSOs):

Upon completion of the Petroleum Engineering and Technology program, students will acquire essential skills in various facets of the oil and gas industry and will possess the capability to:

1. Proficiently analyze, design, and resolve challenges related to surface logging, drilling operations, production evaluation, mud gas sampling, and cuttings characterization at the well site.

2. Skillfully plan, design, install, optimize, and maintain petrochemical plants, while strategically evaluating the driving forces that may impact the future of oil refineries.

3. Embrace a multidisciplinary approach to foster the production of cleaner energy in compliance with environmental regulations and safety considerations.

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PROGRESS THROUGH KNOWLEDGE
# B.Tech. Petroleum Engineering and Technology Regulations – 2023

## Choice Based Credit System (CBCS)

Curriculum and Syllabi for I and II Semesters

### Semester I

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<tr>
<th>S. No.</th>
<th>Course Code</th>
<th>Course Title</th>
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*Skill Based Course

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*Skill Based Course

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

UNIT I  BASICS OF COMMUNICATION  9
Listening – Telephone conversation & Writing message, gap filling; Reading – Telephone message, bio-note; Writing – Personal profile; Grammar – Simple present tense, Present continuous tense, Asking questions (wh-questions); Vocabulary – One word substitution, Synonyms

UNIT II  NARRATION  9
Listening – Travel podcast / Watching a travel documentary; Reading – An excerpt from a travelogue, Newspaper Report; Writing – Narrative (Event, personal experience etc.); Grammar – Subject – verb agreement, Simple past, Past continuous Tenses; Vocabulary – Antonyms, Word formation (Prefix and Suffix).

UNIT III  DESCRIPTION  9
Listening – Conversation, Radio/TV advertisement; Reading – A tourist brochure and planning an itinerary, descriptive article / excerpt from literature; Writing – Definitions, Descriptive writing, Checklists; Grammar – Future tense, Perfect tenses, Preposition; Vocabulary – Adjectives and Adverbs

UNIT IV  CLASSIFICATION  9
Listening – Announcements and filling a table; Reading – An article, social media posts and classifying (channel conversion – text to table); Writing – Note making, Note taking and Summarising, a classification paragraph; Grammar – Connectives, Transition words; Vocabulary – Contextual vocabulary, Words used both as noun and verb, Classification related words.

UNIT V  EXPRESSION OF VIEWS  9
Listening – Debate / Discussion; Reading – Formal letters, Letters to Editor, Opinion articles / Blogs; Writing – Letter writing/ Email writing (Enquiry / Permission, Letter to Editor); Grammar – Question tags, Indirect questions, Yes / No questions; Vocabulary – Compound words, Phrasal verbs.

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

End Semester Exam: 3-hour written exam

TOTAL : 45 PERIODS

COURSE OUTCOMES
At the end of the course, students will be able to
CO1: Use grammar and vocabulary suitable for general context.
CO2: Comprehend the nuances of spoken and written communication.
CO3: Use descriptive and analytical words, phrases, and sentence structures in written communication.
CO4: Read different types of texts and comprehend their denotative and connotative meanings.
CO5: Write different types of texts using appropriate formats.
TEXT BOOKS:
1. “English for Science & Technology I” by Cambridge University Press, 2023
2. “English for Engineers and Technologists” Volume I by Orient Blackswan, 2022

REFERENCE BOOKS
4. www.uefap.com

### CO-PO & PSO MAPPING

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<th>CO</th>
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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 (9+3)

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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 solve 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

#### 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
PH3151 ENGINEERING PHYSICS

OBJECTIVES

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

UNIT I  MECHANICS OF MATERIALS


UNIT II  OSCILLATIONS, SOUND AND THERMAL PHYSICS


UNIT III  OPTICS AND LASERS


UNIT IV  QUANTUM MECHANICS


UNIT V  CRYSTAL PHYSICS


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

CO1: Understand the important mechanical properties of materials

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

TOTAL: 45 PERIODS
CO3: Know the basics of optics and lasers and its applications
CO4: Understand the basics and importance of quantum physics.
CO5: Understand the significance of crystal physics.

TEXT BOOKS:

REFERENCES:

CO-PO & PSO MAPPING

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• 1’ = Low; ‘2’ = Medium; ‘3’ = High

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 nano materials.
- 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

TOTAL: 45 PERIODS

COURSE OUTCOMES:
CO1: To recognize and apply basic knowledge on different types of polymeric materials, their general preparation methods and applications to futuristic material fabrication needs.
CO2: To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
CO3: To recognize and apply basic knowledge on suitable corrosion protection technique for practical problems.
CO4: To recognize different storage devices and apply them for suitable applications in energy sectors.
CO5: To demonstrate the knowledge of water and their quality in using at different industries.

TEXT BOOKS:

REFERENCE BOOKS:

CO - PO Mapping

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

UNIT – I ELECTRICAL CIRCUITS

UNIT – II ELECTRICAL MACHINES

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

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

UNIT – V MEASUREMENTS AND INSTRUMENTATION

TOTAL: 45 PERIODS

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

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

TOTAL: 30 PERIODS

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

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1 – Slight, 2 – Moderate, 3 – Substantial

TEXT BOOKS:

REFERENCES:
அலகு I  மரபு மரபு முழுநிலைமுறை


அலகு II  மரபு - பார்வை விளக்கப்படும் மொழி - தமிழ் விளக்கப்படும் மொழி: 3

3. தமிழ் விளக்கம் - சிற்றிலக்கு - சுவாசகம் - தமிழ் விளakn..}

அலகு III  நொட்டுப்புறக் கறறலகள்: 3

3. நொட்டுப்புறக் கறறலகள் - சிற்றிலக்கு - சுவாசகம் - நொட்டுப்புறக் கறறலகள் - சிற்றிலakn..}

அலakn..}

அலakn..}

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCEBOOKS

1. தமிழ் விளக்கம் - சிற்றிலக்கு - சுவாசகம் - தமிழ் விளakn..}

2. கல்வி விளakn..}

3. தமிழ் விளakn..}
4. பாரந்தி – குறிச்சிக்குரு தந்திகிழ. (பதிப்பில் காட்டு எடுக்கிப்)
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. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
7. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
8. 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)
9. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
10. 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
UNIT I LANGUAGE AND LITERATURE 3

UNIT II HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE 3
Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - Massive Terracottas sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

UNIT III FOLK AND MARTIAL ARTS 3
Therukoothu, Karagatam, VilluPattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

UNIT IV THINAICONCEPTOFTAMILS 3
Flora and Fauna of Tamils & AhamandPuram 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 3
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
GE3161  ENGINEERING PRACTICES LABORATORY  

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

GROUP – A (CIVIL & ELECTRICAL)

1. CIVIL ENGINEERING PRACTICES

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

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

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

2. ELECTRICAL ENGINEERING PRACTICES

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

GROUP – B (MECHANICAL AND ELECTRONICS)

3. MECHANICAL ENGINEERING PRACTICES  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.

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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TOTAL: 60 PERIODS

CY3161 CHEMISTRY LABORATORY  L T P C  0 0 2 1

(Minimum of 8 experiments to be conducted)

LIST OF EXPERIMENTS:
1. Estimation of HCl using 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 electro-analytical techniques.
- Predict the choice of metals for industrial purposes using corrosion studies.

TEXTBOOKS:

CO - PO Mapping

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

GE3162 ENGLISH LABORATORY – I

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

UNIT II NARRATION
Narrating one’s personal experience in front of a group (formal and informal context)
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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- 1-low, 2-medium, 3-high, "-" no correlation
- Note: The average value of this course to be used for program articulation matrix.

HS3251  ENGLISH FOR COMMUNICATION – II

UNIT I  CAUSE AND EFFECT

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

UNIT II  COMPARATE AND CONTRAST

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

UNIT III  PROBLEM AND SOLUTION

Listening – Group discussion (case study); Reading – Visual content (Pictures on social issues / natural disasters) for comprehension; Editorial; Writing Picture description; Problem and Solution Essay; Grammar – Modal verbs; Relative pronoun; Vocabulary – Negative prefixes, Signal words for problem and solution.
UNIT IV REPORTING
Listening – Oral news report; Reading – Newspaper report on survey findings – Writing – Survey report, Making recommendations; Grammar – Active and passive voice, Direct and Indirect speech; Vocabulary – Reporting verbs, Numerical adjectives.

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

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

End Semester Exam: 3-hour written exam

TOTAL : 45 PERIODS

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

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

REFERENCE BOOKS
4. www.uefap.com

CO-PO & PSO MAPPING

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- 1’ = Low; ‘2’ = Medium; ‘3’ = High
COURSE OBJECTIVES:

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

UNIT I  ORDINARY DIFFERENTIAL EQUATIONS (9+3)

UNIT II  LAPLACE TRANSFORMS (9+3)

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

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

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

TOTAL: 60 PERIODS

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

TEXT BOOKS:

REFERENCES:

COPO Mapping

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1-low, 2-medium, 3-high, ‘-’- no correlation

AS3201 ORGANIC CHEMISTRY FOR TECHNOLOGISTS L T P C 3 0 0 3

OBJECTIVE
The course is aimed to teach various reaction mechanisms, preparation of organic compounds and their properties which will be a base for the study on Chemical Reaction Engineering

UNIT I CARBOHYDRATES
Introduction – various definitions and classifications of carbohydrates – Configurations of aldoses and ketoses upto six carbon atoms- D and L configurations – Anomerism- Epimerism- Preparation, Chemical properties, different structures (Fisher, Haworth, Pyranose and Furanose) and Uses of Monosaccharides (Glucose & Fructose). Ascending in carbohydrate series – (Aldo pentose to aldo hexose by Kiliani- Fischer, Improved Kiliani Fischer, Wolfrom and Sowden methods) – Descending in carbohydrate series (Aldo hexose to aldo pentose by Ruff, Wohl and Mac Donald methods) - aldose to isomeric Ketose – Ketose to isomeric Aldose – Aldose to epimer
UNIT II   HETEROCYCLIC COMPOUNDS
Preparation and Industrial applications of 5 and 6 membered hetero cyclic compounds and their derivatives – Pyrrole, Furan, Furfural, Tetrahydro Furan, Thiophene and Pyridine and fused heterocyclic compounds -Indole, Quinoline and Isoquinoline. Conversion of THF into Nylon 6-6

UNIT III   SYNTHESIS OF IMPORTANT ORGANIC COMPOUNDS
Synthesis of hydrocarbons, higher alkanes, alkenes, alkynes, alcohols, esters, aldehydes, mono and di carboxylic acids, diketones, cyclic compounds and ring opening reactions from Grignard reagent, Ethyl aceto acetate and Malonic ester

UNIT IV   DYE CHEMISTRY
Theory of color and constitution: chromophore and auxochrome, classification of dyes based on application. Witt’s theory and modern theory of colors – synthesis of azo dye, methyl red, methyl orange, congo red, malachite green, p-rosaniline, phenolphthalein, fluorescence, eosin dyes.

UNIT V   PHARMACEUTICAL CHEMISTRY
Synthesis of Malonyl urea, Phenacetin, Isoniazid, Para amino benzoic acid (PABA), Tryptophan Isopentaquine, chloroquine (precursors from m-chloroaniline and Ethyl aceto acetate) - Sulphanilamide from aniline, chloro benzene, p- toluene sulphonamide - Sulphapyridine from N- ASC and p-nitrochlorobenzene and Chloramphenicol (by Baltz and Long’s method). Salol from phenol

OUTCOMES:
On successful completion of the course students are expected to
CO1: Classify different types of carbohydrates and to prepare them.
CO2: Discuss the properties and uses of heterocyclic compounds
CO3: Compare and contrast the chemical properties of Grignard reagent, EAA and malonic ester
CO4: Recall the theories and mechanism and to practice reaction of dyes.
CO5: Describe the procedure for synthesizing various Pharmaceutical drugs and their uses.

TEXT BOOKS:

REFERENCES:
# Course Articulation Matrix:

<table>
<thead>
<tr>
<th>Course Outcomes</th>
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<td>CO5</td>
<td>Describe the procedure for synthesizing various Pharmaceutical drugs and their uses.</td>
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
Objectives

- To understand basics of problem solving and design solutions for computational problems.
- To apply different control structures in Python programming and solve using functions.
- To apply different data structures in Python.
- To use built-in and user defined modules in Python.
- To develop applications for file manipulation with error and exception handling in Python.

UNIT I  PROGRAMMING BASICS  6+12
PRACTICALS:
- Design algorithms for simple computational problems
- Develop Pseudocode and Flow charts for simple computational problems
- Develop Python programs using Input / Output operations
- Develop Python programs using operators and expressions
- Executing simple programs using Python interactive mode

UNIT II  CONTROL STATEMENTS AND FUNCTIONS  6+12
PRACTICALS:
- Write Python programs using simple and nested selective control statements
- Develop Python programs using simple and nested repetitive control statements
- Write Python programs to generate series and patterns using repetitive control statements
- Develop Python programs using simple functions and recursion
- Write Python programs using lambda functions

UNIT III  STRING, LIST, TUPLES  6+12
PRACTICALS:
- Write Python programs for operating on Strings
- Design Python programs using Lists, Nested Lists and Lists comprehensions
- Develop Python programs using Tuples, Nested Tuples, Tuple comprehensions, and Sets

UNIT IV  SETS & DICTIONARIES, FUNCTIONAL PROGRAMMING  6+12
PRACTICALS:
- Write Python programs creating sets and performing set operations
- Develop Python programs using Dictionary, Nested Dictionary and comprehensions
- Write Python programs by applying functional programming concepts
- Create, import, and use user-defined modules
- Organize python code using Packages
UNIT V EXCEPTIONS AND FILE HANDLING


PRACTICALS:
- Design Python programs to handle errors and exceptions
- Write Python programs with multiple handlers for exceptions
- Write Python programs to perform various operations on files
- Write Python programs to read and update text and data files

TOTAL : 90 (30+60) PERIODS

COURSE OUTCOMES
1. Understand algorithmic solutions to simple computational problems.
2. Develop Python programs using conditional statements to solve computational problems.
3. Ability to apply suitable Python data structure(s) for a given problem
4. Design modular Python programs
5. Develop Python programs over files and handle exceptions

TEXT BOOKS

REFERENCE BOOKS
4. Python official documentation and tutorial, https://docs.python.org/3/

CO's-PO's & PSO's MAPPING

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1 : low, 2 : medium, 3 : high, '-' : no correlation
GE3155 ENGINEERING DRAWING

CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION)

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE CURVES

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

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACE

Orthographic projection- Principal planes - First angle projection - projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III PROJECTION OF SOLIDS AND FREEHAND SKETCHING

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

UNIT IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES

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

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

TOTAL : 90 PERIODS

COURSE OUTCOMES:

On successful completion of this course, the student will be able to

CO1. Draw conic curves, cycloids and involutes
CO2. Draw orthographic projections of points, lines and planes
CO3. Draw orthographic projections and free hand sketches of solids
CO4. Draw sectional views of the objects and development of surfaces.
CO5. Draw isometric and perspective views of simple solids

TEXTBOOKS:
REFERENCES:

Publication of Bureau of Indian Standards:

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

CO-PO & PSO MAPPING

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- 1-low, 2-medium, 3-high, "-" no correlation
அலகு I  தமிழரும்மதொழில்நுட்பம்:  
3  
சது காட்சியில் நிறுவு இதுவு பாதுகாக்க குழுவு சதுப் திரும் பாதுகாக்க சாலையானது பாதுகாக்க சாலையானது.

அலகு II  அலகரம்புபொழிவுச் சமயிலிருப்பவுத்தியலிலிருப்பவு:  
3  
சது காட்சியில் அலகரம்புபொழிவுச் சமயிலிருப்பவு கருத்திய பாதுகாக்க சது காட்சியில் பாதுகாக்க சுருக்கது திருமுறையை இனப்பாதுகாக்க ரோஜா அல்லாம்பு புறநிலைகள் - பாதுகாக்க சுருக்கது கையேற்று விளக்கக் கையேற்று பாதுகாக்க சுருக்கது.  இசையேற்று விளக்கது - அல்லாம்பு காட்சியில் பாதுகாக்க சுருக்கது ஆறு அரசியல், உயிரியர் பிரசாத அல்லாம்புமுறையில் புறநிலைகள் - பிரசாத ஆறு அரசியல் நீண்டும் புறநிலைகள் நீண்டும் புறநிலைகள் - வாழ்க்கை பாதுகாக்க சுருக்கது வருட காலம்  காலம்.

அலகு III  வைப்புத்தியலிலிருப்பவு:  
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சது காட்சியில் காலம்  சது காட்சியில் வைப்பு திருமுறையிலிருப்பவு - வைப்பு வைப்பு திருமுறையிலிருப்பவு காலம் - வாழ்க்கை வைப்பு திருமுறையிலிருப்பவு - வாழ்க்கை வைப்பு திருமுறையிலிருப்பவு - வாழ்க்கை வைப்பு திருமுறையிலிருப்பவு - வாழ்க்கை வைப்பு திருமுறையிலிருப்பவு - வாழ்க்கை வைப்பு திருமுறையிலிருப்பவு.

அலகு IV  வாழ்க்கையைப்புத்தியலிலிருப்பவு:  
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அலகு IV  வாழ்க்கையைப்புத்தியலிலிருப்பவு - வாழ்க்கையைப்புத்தியலிலிருப்பவு - வாழ்க்கையைப்புத்தியலிலிருப்பவு - வாழ்க்கையைப்புத்தியலிலிருப்பவு - வாழ்க்கையைப்புத்தியலிலிருப்பவு - வாழ்க்கையைப்புத்தியலிலிருப்பவு.

அலகு V  அருவியாத்தியலிலிருப்பவு:  
3  
1. இதுவு பாதுகாக்க சாலை உயிரியான் சாலையானது - இதுவு பாதுகாக்க சாலையானது (சாலையானது  சாலையானது).
2. உயிரியான் சாலை - பாதுகாக்க சாலை (சாலையானது  சாலை).
3. சாலையான் சாலை - பாதுகாக்க சாலை (சாலை).
4. பாதுகாக்க சாலை (சாலை).
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils – The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
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10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (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 L T P C
1 0 0 1

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

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

UNIT III MANUFACTURING TECHNOLOGY

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

UNIT V SCIENTIFIC TAMIL & TAMIL COMPUTING

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS
2. சமணத்திய குருகை - பல்லவர் முது. குருகை (ஹித்திய பிரிட்டிஷு).
3. இதிலான சமணத்தியக் குருகைப் புதுக்கள் தொகுத்தல் காலம் (தியாணத்து கலை புரேஷ்மன்)
4. பைரெட் – பெராசல் சமணக் குருகை (தியாணத்து கலை புரேஷ்மன்)
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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NCC Credit Course Level 1*

NX3251

(ARMY WING) NCC Credit Course Level - I

L T P C

2 0 0 2

NCC GENERAL

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

NATIONAL INTEGRATION AND AWARENESS

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

PERSONALITY DEVELOPMENT

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

LEADERSHIP

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

SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

SS 1 Basics, Rural Development Programmes, NGOs, Contribution of Youth 3
SS 4 Protection of Children and Women Safety 1
SS 5 Road / Rail Travel Safety 1
SS 6 New Initiatives 2
## NCC Credit Course Level 1*

### NX3252  
(NAVAL WING) NCC Credit Course Level - I  

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### NATIONAL INTEGRATION AND AWARENESS

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### PERSONALITY DEVELOPMENT

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### LEADERSHIP

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<td>L 1</td>
<td>Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code</td>
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<td>Case Studies: Shivaji, Jhasi Ki Rani</td>
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### SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

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<td>SS 5</td>
<td>Road / Rail Travel Safety</td>
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<td>SS 6</td>
<td>New Initiatives</td>
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<tr>
<td>SS 7</td>
<td>Cyber and Mobile Security Awareness</td>
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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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<td>Incentives</td>
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<td>NCC 3</td>
<td>Duties of NCC Cadet</td>
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TOTAL : 30 PERIODS
PH3161  PHYSICS LABORATORY  L T P C
0 0 2 1

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.

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

TOTAL: 30 PERIODS

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

CO1: To determine various moduli of elasticity, thermal properties of materials and viscosity of liquids
CO2: To determine the velocity of ultrasonic waves in liquids.
CO3: To calculate and analyse various optical properties.
CO4: To build and analyse 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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<tr>
<th>PO1</th>
<th>PO2</th>
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<th>PO7</th>
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AS3211 ORGANIC CHEMISTRY LABORATORY FOR TECHNOLOGISTS

OBJECTIVES
The course is designed to provide basic principles involved in analysis and synthesis of different organic derivatives, identify the functional groups and separation of organic mixtures

LIST OF EXPERIMENTS
1. Identification and characterization of various functional groups by their characteristic reactions:
a) alcohol, b) aldehyde, c) ketone, d) carboxylic acid, e) phenol f) primary, secondary and tertiary amines
2. Preparation of solid derivatives: a) 2,4 tri nitro phenyl hydrazone for aldehydes and ketones, b) acetyl and benzoyl derivatives for amine and phenol c) diazotization of aromatic amine
3. Preparation of Methyl red and Fluorescein
4. Separation of organic mixtures: a) aldehyde and acid, b) amine and phenol
5. Recrystallization of benzoic acid and acetonilide
7. Detection of peroxide in ether and its removal

**COURSE OUTCOMES:**
On completion of the course students are expected to
CO1: Identify the functional groups and to Prepare derivatives of aldehydes, ketones, sugars, amine and phenol
CO2: Analyze the organic compound mixture for its separation
CO3: Carry out the steps of recrystallization

**REFERENCE:**
1. Practical organic chemistry, S.P. Bhutani, Ane books, 2009
4. Practical Organic Chemistry by Dey and Raman
### Course Articulation Matrix:

<table>
<thead>
<tr>
<th>Course Outcome</th>
<th>Statement</th>
<th>Programme Outcomes</th>
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<tbody>
<tr>
<td>CO1</td>
<td>Identify the functional groups and to Prepare derivatives of aldehydes, ketones, sugars, amine and phenol</td>
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<td>CO2</td>
<td>Analyse the organic compound mixture for its separation</td>
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<td>CO3</td>
<td>Carry out the steps of recrystallization</td>
<td>2      2      1    2    1    -     -     -     -     -     -     -     3     3     -     1</td>
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1, 2 and 3 are correlation levels with weightings as Slight(Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES

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

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

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

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

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

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

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

TOTAL : 30 PERIODS

Learning Outcomes
At the end of the course, students will be able to
- Comprehend and transcode visual content appropriately.
- Participate effectively in formal group discussions.
- Make presentation on a given topic in a formal context.

CO-PO & PSO MAPPING

<table>
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<tr>
<th>CO</th>
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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.