| 24MC001 | INDUCTION PROGRAMME | L T P C<br>- - - 0 |
|---|---|---|

This is a mandatory 2 week programme to be conducted as soon as the students enter the institution. Normal classes start only after the induction program is over.

**The induction programme has been introduced by AICTE with the following objective:**

"Engineering colleges were established to train graduates well in the branch/department of admission, have a holistic outlook, and have a desire to work for national needs and beyond. The graduating student must have knowledge and skills in the area of his/her study. However, he/she must also have broad understanding of society and relationships. Character needs to be nurtured as an essential quality by which he/she would understand and fulfill his/her responsibility as an engineer, a citizen and a human being. Besides the above, several meta-skills and underlying values are needed."

"One will have to work closely with the newly joined students in making them feel comfortable, allow them to explore their academic interests and activities, reduce competition and make them work for excellence, promote bonding within them, build relations between teachers and students, give a broader view of life, and build character. " Hence, the purpose of this programme is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature. The following are the activities under the induction program in which the student would be fully engaged throughout the day for the entire duration of the program.

**(i) Physical Activity**

This would involve a daily routine of physical activity with games and sports, yoga, gardening, etc.

**(ii) Creative Arts**

Every student would choose one skill related to the arts whether visual arts or performing arts. Examples are painting, sculpture, pottery, music, dance etc. The student would pursue it every day for the duration of the program. These would allow for creative expression. It would develop a sense of aesthetics and also enhance creativity which would, hopefully, grow into engineering design later.

**(iii) Universal Human Values**

This is the anchoring activity of the Induction Programme. It gets the student to explore oneself and allows one to experience the joy of learning, stand up to peer pressure, take decisions with courage, be aware of relationships with colleagues and supporting stay in the hostel and department, be sensitive to others, etc. A module in Universal Human Values provides the base. Methodology of teaching this content is extremely important. It must not be through do's and dont's, but get students to explore and think by engaging them in a dialogue. It is best taught through group discussions and real life activities rather than lecturing. Discussions would be conducted in small groups of about 20 students with a faculty mentor each. It would be effective that the faculty mentor assigned is also the faculty advisor for the student for the full duration of the UG programme.

CHAIRMAN
BoS(S&H)

13/05

**(iv) Literary Activity**
Literary activity would encompass reading, writing and possibly, debating, enacting a play etc.

**(v) Proficiency Modules**
This would address some lacunas that students might have, for example, English, computer familiarity etc.

**(vi) Lectures by Eminent People**
Motivational lectures by eminent people from all walks of life should be arranged to give the students exposure to people who are socially active or in public life.

**(vii) Visits to Local Area**
A couple of visits to the landmarks of the city, or a hospital or orphanage could be organized. This would familiarize them with the area as well as expose them to the under privileged.

**(viii) Familiarization to Dept./Branch & Innovations**
They should be told about what getting into a branch or department means what role it plays in society, through its technology. They should also be shown the laboratories, workshops & other facilities.

**(ix) Department Specific Activities**
About a week can be spent in introducing activities (games, quizzes, social interactions, small experiments, design thinking etc.) that are relevant to the particular branch of Engineering/Technology/Architecture that can serve as a motivation and kindle interest in building things (become a maker) in that particular field. This can be conducted in the form of a workshop. For example, CSE and IT students may be introduced to activities that kindle computational thinking, and get them to build simple games. ECE students may be introduced to building simple circuits as an extension of their knowledge in Science, and so on. Students may be asked to build stuff using their knowledge of science. Induction Programme is totally an activity based programme and therefore there shall be no tests / assessments during this programme.

**References: Guide to Induction program from AICTE**

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| 24EN101 | COMMUNICATIVE ENGLISH<br>(Common to All Branches) | L T P C<br>3 0 0 3 |
|---|---|---|

**OBJECTIVES:**

**The students should be made to:**

- Develop basic communication skills in English.
- Enhance the speaking skills for academic, professional and social purposes.
- Use of the electronic media such as internet and other online resources for their language development.
- Inculcate the habit of reading and writing for the purpose of effective communication
- Develop confidence in learners to communicate in English for all purposes

**UNIT I BASICS OF COMMUNICATION** 9

Listening: Basics of listening-Intensive and Extensive Listening, Barriers to Effective Listening; Speaking: Speaking about Future plans- Giving instruction to use the product, Reading: Skimming and Scanning, Writing: Writing about one's leisure time activities, hometown, everyday activities etc., Grammar: Parts of speech, Prepositions, Vocabulary: Word formation.

**UNIT II CREATIVE COMMUNICATION** 9

Listening: Listening to short lectures /talks, Speaking: Telephonic interview, Reading: Reading Editorial and Opinion Blogs, Writing: Biographical writing - Writing a paragraph (Cause and Effect/Compare and Contrast/Narrative/Analytical) - Grammar: Gerund and Infinitive - Present Tense, Vocabulary: Abbreviations & Acronyms.

**UNIT III FUNCTIONAL COMMUNICATION** 9

Listening: Listening to radio and TV and taking notes - Focused audio tracks, Speaking: Role Play - Group Interaction, Reading: Reading magazines, Writing: Letter (Informal /Formal – Industrial Visit, Internship, etc),Writing a set of instructions, Grammar: Past Tense -Subject - Verb Agreement, Vocabulary: Question Tags.

**UNIT IV ANALYTICAL SKILLS** 9

Listening: Listening to select talks by eminent personalities, speaking: Speaking in mock Interviews, Reading: Reading advertisements, Writing: Writing a set of recommendations, Interpreting Visual Materials (Line Graphs, Pie Charts etc.), Grammar: Sentence Pattern, Future Tense, Articles, Vocabulary: Single word substitutes.

**UNIT V PROFESSIONAL COMMUNICATION** 9

Listening: Understanding different Accents,Listening to TED talks, Speaking: Giving impromptu talks- Making presentations, Reading: Reading and comprehending a passage, Writing: Letter to the editor- Check list, Grammar: Direct and Indirect Speech, Vocabulary: Phrasal Verbs.

**TOTAL: 45 PERIODS**

CHAIRMAN
BoS (S&H) 19/02/25

**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Use suitable vocabulary with confidence and express their ideas both in speech and writing.
- Write intelligibly avoiding grammatical errors, using a range of vocabulary, organizing their ideas logically on a topic.
- Speak confidently, with one or many listeners using appropriate communicative strategies.
- Read different genres of texts adopting various reading strategies.
- Understand different spoken discourses/excerpts in different accents.

**TEXT BOOKS**:

1. Kumar, Sanjay and Lata, Pushp, "Communication Skills", Oxford University Press. 2018.

**REFERENCES:**

1. DuttP. Kiranmai and Rajeevan Geeta, "Basic Communication Skills", Foundation Books, 2007.
2. Mohan, Krishna and Banerji Meera, "Developing Communication Skills", Macmillan Publishers India Ltd., Delhi: 2009.
3. Martin Hewings "Advanced English Grammar: A self study reference and Practice book for advanced South Asian students" Cambridge University Press, Delhi: 2016.

**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | 2 | - | - | 2 | - | 1 | 2 | 3 | - | 2 |
| **CO2** | - | - | 2 | - | 2 | - | - | 2 | 3 | 1 | - |
| **CO3** | - | - | 2 | - | 2 | 1 | 2 | 3 | 3 | 2 | 2 |
| **CO4** | - | - | - | 2 | 2 | 1 | 2 | 3 | 3 | 2 | 2 |
| **CO5** | 2 | 3 | - | 2 | 3 | - | 2 | - | 3 | 1 | 2 |

CHAIRMAN
BoS (S&H) 19/02/25

| 24MA101 | MATRICES AND CALCULUS<br>(Common to All Branches) | L T P C<br>3 1 0 4 |
|---|---|---|

**OBJECTIVES:**

**The students should be made to:**

- Introduce the matrix techniques and to illustrate the nature of the matrix.
- Remember the basic concepts of solving algebraic and transcendental equations.
- Apply the formula for the curvature of a curve defined in Cartesian coordinates.
- Analyze the Partial differentiation, concept of total derivative, finding maxima and minima of function of two variables.
- Evaluate the techniques of integration in finding area and volume.

**UNIT I MATRICES** **9+3**

Eigenvalues and eigenvectors of a real matrix - Properties of eigenvalues and eigenvectors - Cayley-Hamilton theorem (Without proof) - Application of Cayley - Hamilton theorem ($A^{-1}$,$A^n$)- Nature of quadratic forms - Reduction of a quadratic form to canonical form by orthogonal transformation.

**UNIT II SYSTEM OF LINEAR EQUATIONS** **9+3**

Newton Raphson method- Bisection Method -Solution of linear system of equations by matrix method, Gauss-Jordan, Gauss- Jacobi and Gauss-Seidel methods- Eigen values of a matrix by Power method.

**UNIT III DIFFERENTIAL CALCULUS** **9+3**

Curvature in Cartesian co-ordinates – Centre and radius of curvature – Circle of curvature – Evolutes – Envelopes - Evolute as envelope of normal.

**UNIT IV FUNCTIONS OF SEVERAL VARIABLES** **9+3**

Partial derivatives - Total derivative - Differentiation of implicit functions - Jacobians - Taylor's series for functions of two variables - Maxima and minima of functions of two variables.

**UNIT-V MULTIPLE INTEGRALS IN CARTESIAN COORDINATES** **9+3**

Double integration- Change of order of integration- Area between two curves- Triple integration- Volume as triple integrals.

**TOTAL: (45+15) PERIODS**

**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Develop problem-solving skills using systems of equations and matrix transformations.
- Evaluate the efficiency of numerical methods based on the number of iterations required to achieve a desired level of accuracy.
- Compute the radius of curvature and interpret its significance for different types of curves.
- Expand a given function into a series and determine the maximum and minimum of multivariate functions.
- Apply the concepts of double and triple integrals in mathematical and real-world contexts.

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BoS (S&H) 19/02/25

**TEXT BOOKS:**

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition, 2017.
2. Burden, R.L and Faires, J.D, "Numerical Analysis", 9th Edition, Cengage Learning, 2018.

**REFERENCES:**

1. Kreyszig Erwin, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2018.
2. Sankara Rao. K., "Numerical Methods for Scientists and Engineers", Prentice Hall of India Pvt. Ltd, 4th Edition, New Delhi, 2021.
3. Ramana B V "Higher Engineering Mathematics", New Delhi Tata McGraw- Hill Education India Private Limited., 2021
4. Gerald. C.F., and Wheatley. P.O. "Applied Numerical Analysis" 7th Edition, Pearson Education India, 2017.

**Mapping of COs with Pos**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 2 | - | - | - | - | - | 2 |
| CO2 | 3 | 3 | 2 | 3 | 2 | - | - | - | - | - | 2 |
| CO3 | 3 | 3 | 2 | 2 | 2 | 1 | - | - | - | - | 2 |
| CO4 | 3 | 3 | 2 | 3 | 3 | 1 | - | - | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | - | - | 3 |

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BoS (S&H) 19/02/25

| 24PH101 | ENGINEERING PHYSICS<br>(Common to All Branches) | L T P C<br>3 0 2 4 |
|---|---|---|

**OBJECTIVES:**

**The students should be made to:**

- Recall the mechanical properties of materials.
- Gain knowledge on electrical properties of materials.
- Understand the properties of magnetic and superconducting materials.
- Examine basic quantum mechanical concepts and their applications.
- Acquire the basic knowledge about nano phase materials and their properties.

**UNIT I MECHANICAL PROPERTIES OF SOLIDS 9**

Elasticity and Plasticity - stress-strain diagram and its uses - Hooke's law - factors affecting elastic modulus - bending of beams - bending moment - cantilever: theory and experiment - uniform and non-uniform bending: theory and experiment – I shaped girders and its applications.

**UNIT II ELECTRICAL PROPERTIES OF MATERIALS 9**

Classical free electron theory of metals - Electrical conductivity and thermal conductivity of metals - Wiedemann - Franz law - Failures of classical free electron theory - Success of Quantum free electron theory - Fermi distribution function and its variation with temperature - Density of energy states-carrier concentration of metals.

**UNIT III MAGNETIC AND SUPERCONDUCTING MATERIALS 9**

Classification of magnetic materials - Domain theory of ferromagnetism - Hysteresis - Soft and Hard magnetic materials - Superconducting materials – Meissner effect - Isotopic effect - BCS theory of superconductors - Type I & Type II superconductors - Applications of superconductors.

**UNIT IV QUANTUM PHYSICS 9**

Black body radiation - Planck's theory (derivation) - Deduction of Wien's displacement law and Rayleigh Jeans' Law from Planck's theory-de-Broglie wavelength - Properties of matter waves - Schrodinger's wave equations - Time independent and time dependent wave equations - Physical significance of wave function - Particle in a one dimensional potential box.

**UNIT V NEW ENGINEERING MATERIALS 9**

Metallic glasses - Types - Preparation - Properties and applications - Shape Memory Alloys (SMA) - Characteristics and applications - Advantages and disadvantages of shape memory alloys - Synthesis of nanomaterials - Top down approaches (Ball Milling) and Bottom up approaches (CVD and PVD).

**TOTAL: 45 PERIODS**

CHAIRMAN
BoS (S&H) 19/02/25

## LIST OF THE EXPERIMENTS – PHYSICS LABORATORY

1. Determination of Young's modulus of the material by Non-uniform bending method.
2. Determination of Rigidity modulus of the wire using Torsion Pendulum.
3. Determination of band gap energy of a semiconductor.
4. Determination of thickness of the thin film/wire by forming the fringe using Air wedge method.
5. Determination of velocity of ultrasonic waves in a liquid and compressibility of liquid using ultrasonic Interferometer.

**TOTAL: 30 PERIODS**

**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Identify the mechanical properties of materials and their significance in engineering applications.
- Interpret the electrical properties of materials and their role in various technological applications.
- Illustrate the magnetic and superconducting properties of materials and their practical implications.
- Apply fundamental quantum mechanical concepts to understand material behavior at the atomic level.
- Explore the properties and applications of smart materials in modern engineering solutions.

**TEXT BOOKS:**


1. M.N. Avadhanulu, P.G. Kshirsagar, TVS Arun Murthy "A Text book of Engineering Physics", S.Chand and Company Ltd, New Delhi, 11th Edition.2022.
2. Rajendran. V. "Materials Science", McGraw Hill Education (India) Private Limited, New Delhi, 2017.
3. S.O Pillai, "Solid State Physics" New Age International Publishers, New Delhi, 10th Edition, 2022.


**REFERENCES:**


1. R. K. Gaur and S.L. Gupta, "Engineering Physics", Dhanpat Rai Publications, New Delhi, Reprint 2022.
2. Wahab. M.A, "Solid State Physics' Narosa Publishing House, New Delhi, 4th Edition. 2023.
3. D. Halliday, R. Resnick and J. Walker, Principles of Physics, Wiley (11th Edition), 2020.
4. Malik.K and Singh. A.K, "Engineering Physics" TMH, New Delhi 2nd Edition - 2020.


CHAIRMAN
BoS (S&H) 19/02/25

## LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS

## PHYSICS LABORATORY

| S.No. | Name of Equipment | Quantity Required |
|---|---|---|
| 1 | Torsional pendulum with accessories | 6 Nos. |
| 2 | Non - Uniform bending with accessories | 6 Nos. |
| 3 | Ultrasonic interferometer. | 6 Nos. |
| 4 | Air wedge with accessories | 6 Nos. |
| 5 | Band gap kit | 6 Nos. |

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BoS (S&H) 19/02/25

**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 3 | 1 | 1 | - | - | - | - | - | 1 |
| **CO2** | 3 | 2 | 2 | 3 | 2 | - | - | - | - | - | 2 |
| **CO3** | 3 | 3 | 2 | 3 | 2 | 1 | - | - | - | - | - |
| **CO4** | 3 | 2 | 2 | 3 | 3 | - | - | - | - | - | 2 |
| **CO5** | 2 | 2 | 2 | 2 | 2 | 2 | - | - | - | - | 3 |

CHAIRMAN
BoS (S&H) 19/02/25

| 24CY101 | ENGINEERING CHEMISTRY<br>(Common to All Branches) | L T P C<br>3 0 2 4 |
|---|---|---|

**OBJECTIVES:**

**The student should be made to:**

- Gain knowledge on various sources of water and its industrial applications.
- Explore the essentials of electrochemistry, types of corrosion and its prevention.
- Examine the fundamentals of polymer, various engineering plastics and composites.
- Study the concept of Phase diagrams, different types of energy storage devices and emerging batteries.
- Assess the types of fuels and its quality estimation.

**UNIT I WATER TECHNOLOGY** **9**

Sources of water - Hard and soft water - Boiler feed water-requirements - disadvantages of using hard water in boilers (Scale, Sludge, Caustic Embrittlement, Priming and Foaming) - Municipal water treatment (screening, sedimentation, coagulation, filtration and disinfection - ozonolysis, UV treatment, chlorination). Internal conditioning (Phosphate, Calgon, Colloidal and Carbonate conditioning methods) - External conditioning - Zeolite and demineralization process - desalination by reverse osmosis.

**UNIT II ELECTROCHEMISTRY AND CORROSION SCIENCE** **9**

Electrochemistry - Nernst equation & its Applications - Electrochemical (EMF) series - Corrosion - Types - Chemical and Electrochemical corrosions - Galvanic corrosion - Differential aeration corrosion - Pitting corrosion - Corrosion control - material selection and design - sacrificial anodic method and impressed current cathodic protection method - Organic coatings - Paint and its constituents.

**UNIT III POLYMERS AND COMPOSITES** **9**

Introduction: Functionality - degree of polymerization. Classification of polymers (Source, Structure, Synthesis and Intermolecular forces) - Mechanism of free radical polymerization - Engineering Plastics: Polyamides, Polycarbonates and Polyurethanes.

Composites: Need, Composition of composites - Definition, examples and applications of Metal matrix composites (MMC), Ceramic matrix composites (CMC) and Polymer matrix composites (PMC)

**UNIT IV PHASE RULE AND ENERGY STORAGE DEVICES** **9**

Phase Rule - Terms involved - One Component system (water system) - Two component system (Lead-Silver system) - Storage devices - types - primary battery (dry cell), secondary battery (lead acid, lithium-ion battery) - Emerging batteries - Aluminum air battery, batteries for automobiles and satellites - Fuel cells - Hydrogen - Oxygen fuel cell.

**UNIT V FUELS AND COMBUSTION** **9**

Fuels – Introduction - Classification of fuels - coal - Analysis of coal (proximate and ultimate) - Carbonization - Manufacture of metallurgical coke (Otto Hoffmann method) - Petroleum - Manufacture of synthetic petrol (Bergius process) - Knocking - Anti knocking - Octane number - Cetane number - Gaseous fuels - LPG, CNG - Combustion: Calorific value - higher and lower calorific values - Theoretical calculation of calorific value - Flue gas analysis (ORSAT Method).

**TOTAL: 45 PERIODS**

CHAIRMAN
BoS (S&H) 19/02/25

## LIST OF THE EXPERIMENTS - CHEMISTRY LABORATORY

1. Estimation of HCl using $Na_2CO_3$ as primary standard and determination of alkalinity in water sample.
2. Determination of total, temporary & permanent hardness of water by EDTA method.
3. Determination of Chloride content of water sample by Argentometric method.
4. Determination of strength of given hydrochloric acid using pH meter.
5. Estimation of Copper content by spectrophotometer.
6. Estimation of iron content of the given solution using potentiometer.
7. Conductometric titration of strong acid Vs strong base.

**TOTAL: 30 PERIODS**

**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Understand the various water treatment methodologies and its applications.
- Recognize corrosion protection techniques and appropriate mitigation strategies.
- Assess different types of polymers, composites and their industrial applications.
- Illustrate the concept of phase diagram, working principles of batteries, emerging energy storage technologies and their applications.
- Analyze the various fuels and their properties.

**TEXT BOOKS:**


1. P. C. Jain and Monica Jain, "Engineering Chemistry", Dhanpat Rai Publishing, Company, New Delhi, 2015.
2. S. S. Dara, "A Text Book of Engineering Chemistry", S Chand & Co. Ltd., New Delhi, 2013.


**REFERENCES:**


1. Shika Agarwal, "Engineering Chemistry", Cambridge University Press, Delhi, 2016.
2. B. Sivashankar, "Engineering Chemistry", Tata Mc. Graw–Hill Publishing Company, Ltd., Delhi, 2012.
3. G Palanna, "Engineering Chemistry", Tata Mc. Graw Hill Education Private Limited, Delhi, 2017.
4. Prasanta Rath,"Engineering Chemistry", Cengage Learning India Pvt. Ltd., Delhi, 2018.


CHAIRMAN
BoS (S&H) 19/02/25

## LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS

## CHEMISTRY LABORATORY

| S.No. | Name of Equipment | Quantity Required |
|---|---|---|
| 1 | pH Meter | 10 Nos. |
| 2 | Digital Conductivity Meter | 10 Nos. |
| 3 | Digital Potentiometer | 10 Nos. |
| 4 | Electronic Balance | 5 Nos. |
| 5 | Deionizer unit | 1 No. |
| 6 | Spectrophotometer | 5 Nos. |

CHAIRMAN
BoS (S&H) 19/02/25

**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 2 | - | 2 | 3 | 2 | - | - | - | - |
| **CO2** | 3 | 2 | - | - | 2 | 3 | 2 | - | - | - | - |
| **CO3** | 3 | - | 2 | 2 | 3 | 2 | - | - | - | - | - |
| **CO4** | 3 | 2 | 1 | - | 3 | 2 | - | - | - | - | 2 |
| **CO5** | 3 | 3 | 1 | - | 2 | 3 | 2 | - | - | - | 2 |

CHAIRMAN
BoS (S&H) 19/02/25

| 24GE102 | ENGINEERING GRAPHICS<br>(Common to All Branches) | L T P C<br>3 0 2 4 |
|---|---|---|

**OBJECTIVES:**

**The student should be made to:**

- Understand the various basic concepts like dimensioning, standards, curves and free hand sketching
- Develop the skills on projection of points, lines and plane surfaces
- Impart knowledge on projection of solids like prisms and pyramids
- Illustrate the section of solids and development of surfaces for various objects
- Acquire skills on viewing of solid objects in Isometric and Perspective projections

**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 geometric dimensioning

**UNIT I PLANE CURVES AND FREE HAND SKETCHING** **9+6**

Curves used in engineering practices: Conics - Construction of ellipse, Parabola and hyperbola by eccentricity method - Construction of cycloid and involutes of square and circle- Drawing of tangents and normal to the above curves.

Visualization concepts and Free Hand sketching: Visualization principles - Representation of Three Dimensional objects - Layout of views – Free hand sketching of multiple views from pictorial views of objects.

**UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACES** **9+6**

Projection of points - Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true length and true inclination by rotating line method - Projection of planes inclined to both the principal planes by rotating object method.

**UNIT III PROJECTION OF SOLIDS** **7+6**

Projection of simple solids like prisms, pyramids, cylinder, cone when the axis is inclined to one of the principal planes by rotating object method.

**UNIT IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES** **9+6**

Sectioning of solids: prisms, pyramids, cylinder, 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, cylinder and cone.

CHAIRMAN
(BoS) MECH

**UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS** **9+6**

Principles of isometric projection - isometric scale - isometric projections of simple solids, truncated and frustum of solids: Prisms, pyramids, cylinder, cone - Perspective projection of simple solids: Prisms, pyramids and cylinder by visual ray method.

**TOTAL: 75 (45+30) PERIODS**

**OUTCOMES:**

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

- Relate the engineering knowledge on dimensioning, standards, curves and free hand sketching objects
- Identify the various views on the projection of points, straight lines and plane surfaces
- Apply the knowledge on projection of solids like prisms and pyramids
- Analyze the section of solids and development of surfaces
- Develop the isometric views and perspective projection of simple solids

**TEXT BOOKS:**


1. Natarajan K V., "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2023.
2. Venugopal K and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2024.


**REFERENCES:**


1. Bhatt N D and Panchal V M., "Engineering Drawing", Charotar Publishing House, 50th Edition, 2023.
2. Basant Agarwal and Agarwal C M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, 2019.
3. Gopalakrishna K R., "Engineering Drawing" (Vol. I & II combined), Subhas Stores, Bangalore, 2017.


**Special points applicable to End Semester Examinations on Engineering Graphics:**

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 of A3 size only. The students will be permitted to use an appropriate scale to fit solution within A3 size.
4. The examination will be conducted in appropriate sessions on the same day.

**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 2 | - | - | - | - | - | 3 | - | 2 |
| CO2 | 3 | 2 | 2 | - | - | - | - | - | 3 | - | 2 |
| CO3 | 3 | 2 | 2 | - | - | - | - | - | 3 | - | 2 |
| CO4 | 3 | 2 | 2 | - | - | - | - | - | 3 | - | 2 |
| CO5 | 3 | 2 | 2 | - | - | - | - | - | 3 | - | 2 |

CHAIRMAN
(BoS / MECH)

| 24TA101 | HERITAGE OF TAMILS<br>(Common to All Branches) | L T P C<br>1 0 0 1 |
|---|---|---|

**OBJECTIVES:**

**The students should be made to:**

- Learn the extensive literature of classical Tamil.
- Analyze rock art paintings to modern art.
- Understand folk and martial arts.
- Apply the concepts of Thinai in Tamils.
- Realize the contribution of Tamils in Indian freedom struggle.

**UNIT I LANGUAGE AND LITERATURE** 3

Language Families in India - Dravidian Languages –Tamil as a Classical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.

**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 Terracotta 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, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

**UNIT IV THINAI CONCEPT OF TAMILS** 3

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** 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**

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BoS (S&H) 19/02/25

**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Recognize the extensive literature Tamil and classical nature.
- Understand the heritage of sculpture, painting and musical instruments.
- Classify the folk and martial arts of Tamil people.
- Realization of Thinai concepts, trade and victory of Chozha dynasty.
- Interpret the contribution of Tamils in Indian freedom struggle, Self- esteem movement and siddha medicine.

**TEXT-CUM-REFERENCE BOOKS**


1. தமிழக வரலாறு - மக்களும் பண்பாடும் – கே. கே. பிள்ளை (வெளியீடு:தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் - முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை -ஆற்றங்கரை நாகரீகம். (தொல்லியல் துறை வெளியீடு).
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.Subatanianian, 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 the river Vaigai' (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu.)
10. Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu.)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.


**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | 2 | 1 | 2 | - | 1 |
| CO2 | - | - | - | - | - | - | 2 | 1 | 2 | - | 1 |
| CO3 | - | - | - | - | - | - | 2 | 1 | 2 | - | 1 |
| CO4 | - | - | - | - | - | - | 2 | 1 | 2 | - | 1 |
| CO5 | - | - | - | - | - | - | 2 | 1 | 2 | - | 1 |

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BoS (S&H) 19/02/25

| 24TA101 | தமிழர் மரபு<br>(அனைத்து துறைகளுக்கும் பொதுவானது) | L T P C<br>1 0 0 1 |
|---|---|---|

**நோக்கங்கள்:**

**மாணவர்கள் கண்டிப்பாக அறிய வேண்டுவன:**

- செம்மொழியான தமிழ் மொழியின் விரிவான இலக்கியத்தைப் பற்றி அறிதல்.
- பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை உள்ள கலைகளை பகுப்பாய்வு செய்தல்.
- நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகளைப் புரிந்துகொள்ளுதல்.
- தமிழர்களின் திணைக் கோட்பாடுகளைச் செயல்படுத்துதல்.
- இந்திய விடுதலைப் போராட்டத்திற்கும் பண்பாட்டிற்கும் தமிழர்களின் பங்களிப்பை உணருதல்

**அலகு 1 மொழி மற்றும் இலக்கியம்** 3

இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ் செவ்விலக்கியங்கள் –சங்க இலக்கியத்தின் சமயச் சார்பற்ற தன்மை - சங்க இலக்கியத்தில் பகிர்தல் அறம்-திருக்குறளில் மேலாண்மைக் கருத்துக்கள்- தமிழ்க் காப்பியங்கள், தமிழகத்தில் சமண பௌத்த சமயங்களின் தாக்கம்- பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் -தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

**அலகு II மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக் கலை** 3

நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - தேர் செய்யும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் -குமரிமுனையில் திருவள்ளுவர் சிலை - இசைக்கருவிகள் - மிருதங்கம், பறை , வீணை , யாழ், நாதஸ்வரம் – தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.

**அலகு III நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்** 3

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஒயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

**அலகு IV தமிழர்களின் திணைக் கோட்பாடுகள்** 3

தமிழகத்தின் தாவரங்களும், விலங்குகளும் - தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் - தமிழர்கள்

CHAIRMAN
BoS (S&H) 19/02/25

போற்றிய அறக்கோட்பபாடு - சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் –சங்ககால நகரங்களும் துறை முகங்களும் -சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - கடல்கடந்த நாடுகளில் சோழர்களின் வெற்றி.

**அலகு V இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு** 3

இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு - இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில் சித்த மருத்துவத்தின் பங்கு - கல்வெட்டுகள், கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

**TOTAL: 15 PERIODS**

**முடிவுகள்:**

**பாடத்தின் முடிவில், மாணவர்கள் அறிந்து கொள்வன**:

- தமிழ் மொழியின் செம்மொழி தன்மையையும் சங்க இலக்கியத்தின் முக்கியத்துவத்தையும் உணர்வார்கள்.
- தமிழர்களின் சிற்ப, ஓவிய, இசை மரபுகளை புரிந்துகொள்வார்கள்.
- நாட்டுப்புறக் கலைகளையும் வீர விளையாட்டுகளையும் வகைப்படுத்துவார்கள்.
- தமிழர்களின் திணைக் கோட்பாடுகளும் சங்ககால வர்த்தகமும் புரிந்துகொள்வார்கள்.
- இந்திய விடுதலைப் போராட்டம், சுயமரியாதை இயக்கம், சித்த மருத்துவம் ஆகியவற்றில் தமிழர்களின் பங்களிப்பை விளக்குவார்கள்.

**உரை மற்றும் குறிப்பு புத்தகங்கள்:**


1. தமிழக வரலாறு - மக்களும் பண்பாடும் – கே. கே. பிள்ளை (வெளியீடு:தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் - முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை -ஆற்றங்கரை நாகரீகம். (தொல்லியல் துறை வெளியீடு).
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.)


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BoS (S&H) 19/12/25

9. Keeladi – 'Sangam City Civilization on the banks of the river Vaigai' (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu.)
10. Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu.)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | 2 | 1 | 2 | - | 1 |
| CO2 | - | - | - | - | - | - | 2 | 1 | 2 | - | 1 |
| CO3 | - | - | - | - | - | - | 2 | 1 | 2 | - | 1 |
| CO4 | - | - | - | - | - | - | 2 | 1 | 2 | - | 1 |
| CO5 | - | - | - | - | - | - | 2 | 1 | 2 | - | 1 |

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| 24GE104L | ENGINEERING PRACTICES LABORATORY<br>(Common to All Branches) | L T P C<br>0 0 4 2 |
|---|---|---|

**OBJECTIVES:**

**The student should be made to:**

- Acquire knowledge in calculation of area and volume of various 2D and 3D shapes and gain practical exposure in pipeline connections and carpentry
- Develop the fundamental skills in welding, machining, sheet metal and foundry works
- Illustrate the basic working principles of air conditioner, industrial robot and washing machine
- Learn the domestic, industrial wiring circuits and measure the electrical parameters
- Demonstrate the basic electronic components in PCB, assemble of smart phone, computer and LED TV

## GROUP A (CIVIL & MECHANICAL)

### I. CIVIL ENGINEERING PRACTICES 15

**Basic Measurements**

1. Calculation of area and volume for various solid and hollow shapes, including cubical, spherical, cylindrical and conical models with different scale conversions.

**Carpentry**

2. Study of industrial trusses and joints in doors and windows using models.
3. Sawing and planing- Making joints: T-joint, Mortise joint, and Tenon joint.

**Plumbing**

4. Laying pipe connections for suction and delivery sides of the pumps and preparation of plumbing line sketches for water supply and sewage works.
5. Connecting various pipe fittings using different materials (metal, plastic, and flexible pipes) and other components which are commonly used in household appliances.

### II. MECHANICAL ENGINEERING PRACTICES 15

**Welding:**

a) Arc Welding
   i) Butt joint
   ii) Lap joint
b) Gas welding practice

**Basic Machining:**

a) Turning and Facing
b) Drilling and tapping

**Sheet Metal work:**

a) Making of a funnel
b) Making of a tray

**Foundry work:**

a) Making a mould using solid pattern
b) Making a mould using split pattern

**Study Experiments**

a) Study of components in Air conditioner
b) Study of components in Industrial robot
c) Study of components in Washing machine

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## GROUP B (ELECTRICAL AND ELECTRONICS)

### III. ELECTRICAL ENGINEERING 15

1. Residential house wiring using switches, fuse, indicator, circuit breaker, lamp and Energy meter
2. Stair case wiring
3. Industrial wiring using switches, fuse, indicator and Energy meter
4. Measurement of electrical quantities - voltage, current, power, power factor and energy in RLC circuit
5. Calculation of energy consumption for different lamps
6. Study of fan with regulator, Iron Box and Emergency Lamp

### IV. ELECTRONICS ENGINEERING 15

1. Study and identification of electronic components -Resistors, Capacitors and Inductors
2. Assembling and testing electronic components in small PCB
3. Assembling and dismantling of Computer/Laptop
4. Assembling and dismantling of LED TV
5. Study of elements in smart phone

**TOTAL: 60 PERIODS**

**OUTCOMES:**

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

- Interpret engineering knowledge on calculation of area and volume of different geometric shapes, connecting various household fittings and making carpentry joints
- Apply engineering skills to do welding, machining, sheet metal and foundry works
- Gain knowledge on Air conditioner, Industrial robot and washing machine
- Understand the domestic, industrial wiring circuits and measure the various electrical parameters
- Analyze the basic components of electronic circuits, computer, laptop, smart phone and LED TV

**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 2 | - | 2 | 2 | - | 2 | - | - | 2 |
| CO2 | 3 | 2 | 2 | - | 2 | 2 | - | 2 | - | - | 2 |
| CO3 | 3 | 2 | 1 | - | 2 | 2 | - | 2 | - | - | 2 |
| CO4 | 3 | 2 | 1 | - | 2 | 2 | - | 2 | - | - | 2 |
| CO5 | 3 | 2 | 2 | - | 2 | 2 | - | 2 | - | - | 2 |

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## 24GE104L ENGINEERING PRACTICES LABORATORY

### LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS

### GROUP A (CIVIL & MECHANICAL)

| S. No | Name of Equipment | Quantity Required |
|---|---|---|
| | **CIVIL ENGINEERING PRACTICES** | |
| **Basic Measurements** | | |
| 1. | Sphere | 03 Nos. |
| 2. | Cylinder | 03 Nos. |
| 3. | Cone | 03 Nos. |
| 4. | Cube | 03 Nos. |
| 5. | Cuboid | 03 Nos. |
| **Carpentry** | | |
| 6. | Industrial truss | 03 Nos. |
| 7. | Door Joint | 03 Nos. |
| 8. | Window Joint | 03 Nos. |
| 9. | Try Square | 15 Nos. |
| 10. | Hand Saw | 15 Nos. |
| 11. | Carpentry bench vice | 15 Nos. |
| 12. | Firmer Chisel | 15 Nos. |
| 13. | Motrin Chisel | 15 Nos. |
| 14. | Iron Jack | 15 Nos. |
| 15. | Mallet | 15 Nos. |
| 16. | Bench hold fastens (C Clamp) | 15 Nos. |
| 17. | Wood Cutting Machine | 2 Nos. |
| 18. | Planer machine | 2 Nos. |
| 19. | Hand drilling Machine | 2 Nos. |
| 20. | Jig Saw | 2 Nos. |
| **Plumbing** | | |
| 21. | Pipe Vice | 15 Nos. |
| 22. | Die Holder with Die set | 10 Nos. |

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(BoS / MECH) 31/05

| S. No | Name of Equipment | Quantity Required |
|---|---|---|
| | **MECHANICAL ENGINEERING PRACTICES** | |
| **Welding** | | |
| 1. | Arc welding unit | 5 Nos. |
| 2. | Gas welding unit | 2 Nos. |
| **Basic Machining** | | |
| 3. | Lathe Machines | 3 Nos. |
| 4. | Drilling Machines | 2 Nos. |
| **Sheet Metal work** | | |
| 5. | Steel rule | 5Nos. |
| 6. | Bend snips | 5 Nos. |
| 7. | Straight snips | 5 Nos. |
| 8. | Scriber | 5 Nos. |
| 9. | Divider | 5 Nos. |
| 10. | Trammel | 5 Nos. |
| 11. | Prick Punches | 5 Nos. |
| 12. | Centre punches | 5 Nos. |
| 13. | Pliers | 5 Nos. |
| 14. | Ball peen hammer | 5 Nos. |
| 15. | Cross peen hammer | 5 Nos. |
| 16. | Bull wart hammer | 5 Nos. |
| 17. | Mallet | 5 Nos. |
| 18. | Anvil | 3 Nos. |
| 19. | Swage block | 3 Nos. |
| 20. | Wire gauges | 2 Nos. |
| **Foundry work** | | |
| 21. | Cope and Drag Box | 5 Nos. |
| 22. | Solid pattern | 5 Nos. |
| 23. | Split pattern | 5 Nos. |
| 24. | Runner | 5 Nos. |
| 25. | Riser | 5 Nos. |
| 26. | Sprue pin | 5 Nos. |
| 27. | Sand rammer | 5 Nos. |
| 28. | Trowel | 5 Nos. |
| **Study Experiments** | | |
| 29. | Air-conditioner unit | 1 No. |
| 30. | Industrial Robot | 1 No. |
| 31. | Washing Machine | 1 No. |

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(BoS / MECH)

**24GE104L** **ENGINEERING PRACTICES LABORATORY (GROUP – B)**

## LIST OF EQUIPMENTS FOR A BATCH OF 30 STUDENTS

| S. No. | Description of Equipment | Quantity Required (Nos) |
|---|---|---|
| **Part III: Electrical Engineering** | | |
| 1. | Single phase house wiring setup | 5 |
| 2. | Three phase house wiring setup | 3 |
| 3. | Staircase wiring setup | 3 |
| 4. | Fluorescent lamp and LED with wiring setup | Each 3 |
| 5. | Emergency lamp wiring setup | 2 |
| 6. | Iron box wiring setup | 2 |
| 7. | Fan with Regulator | 2 |
| 8. | AC Voltmeter, Ammeter, Wattmeter and Energy Meter | Each 4 |
| 9. | R-Load | 4 |
| 10. | Inductive and Capacitive Load | Each 1 |
| **Part IV: Electronics Engineering** | | |
| 1. | Soldering Iron, Lead | 10 Set |
| 2. | Multi meter | 10 |
| 3. | Continuity tester | 10 |
| 4. | Used Laptop | 3 |
| 5. | Used desktop computer | 3 |
| 6. | Used LED TV | 3 |
| 7. | Used Smart Phone | 3 |
| 8. | DC Regulated power supply (0-30V) | 2 |
| 9. | Resistors | 200 |
| 10. | Capacitors | 200 |
| 11. | Diodes | 100 |
| 12. | Transistors | 50 |

CHAIRMAN
BoS(EEE) 26/02/25

**24EEC101L INTERPERSONAL COMMUNICATION LABORATORY L T P C**
**(Common to All Branches) 0 0 2 1**

**OBJECTIVES:**
**The students should be made to:**

- Improve the communicative competence of learners
- Help learners use language effectively in academic/work contexts
- Develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc.
- Build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts.
- Use language efficiently in expressing their opinions via various media.

**UNIT I INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION 6**

Listening for general information-specific details - conversation: Introduction to classmates (formal & informal); Telephone conversation; Speaking - Self Introduction-Introducing a friend; - politeness strategies - making polite requests, making polite offers, replying to polite requests and offers - understanding basic instructions (filling out a bank application for example).

**UNIT II NARRATION AND SUMMATION 6**

Listening - Listening to podcasts, anecdotes / stories / event narration; documentaries and interviews with celebrities. Speaking - Narrating personal experiences / events- Talking about current and temporary situations & permanent and regular situations - describing experiences and feelings engaging in small talk- describing requirements and abilities.

**UNIT III DESCRIPTION OF A PROCESS / PRODUCT 6**

Listening - Listen to product and process descriptions, a classroom lecture; and advertisements about products. Speaking – Picture description- describing locations in workplaces- Giving instruction to use the product- explaining uses and purposes- Presenting a product- describing shapes and sizes and weights- talking about quantities(large & small)- talking about precautions.

**UNIT IV FUNCTIONAL COMMUNICATION 6**

Listening – Listening to TED Talks; Listening to lectures - and educational videos. Speaking – Small Talk; discussing and making plans-talking about tasks-talking about progress- talking about positions and directions of movement-talking about travel preparations- talking about transportation.

**UNIT V PROFESSIONAL SKILLS 6**

Listening – Listening to debates/ discussions; different viewpoints on an issue; and panel discussions. Speaking –making predictions- talking about a given topic.

**TOTAL: 30 PERIODS**

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**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Listen to and comprehend general as well as complex academic information.
- Listen to and understand different points of view in a discussion.
- Speak fluently and accurately in formal and informal communicative contexts.
- Describe products and processes and explain their uses and purposes clearly and accurately.
- Express their opinions effectively in both formal and informal discussions.

**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | 2 | 3 | - | 2 |
| CO2 | - | - | - | - | - | - | 2 | 2 | 3 | - | 2 |
| CO3 | - | - | 2 | - | 3 | - | - | - | 3 | - | - |
| CO4 | - | - | - | - | - | - | - | 2 | 3 | - | 2 |
| CO5 | - | - | - | - | - | 3 | 2 | 2 | 3 | - | - |

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## LIST OF EQUIPMENTS
**Requirements for a batch of 30 students**

| Sl. No. | Description of Equipment/Software | Quantity required (Nos) |
|---|---|---|
| 1 | Computer | 30 |
| 2 | Headphones | 30 |
| 3 | **Software:** Globarena | 30 |

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| 24EN201 | TECHNICAL ENGLISH<br>(Common to All Branches) | L T P C<br>3 0 0 3 |
|---|---|---|

**OBJECTIVES:**

**The students should be made to:**

- Improve understanding of commonly used English usage by cultivating listening skills through informal interactions.
- Enrich their speaking abilities through scenario-based conversations to understand how language functions in context.
- Develop their ability to read critically by analyzing newspaper articles.
- Use group discussion techniques to improve cooperative communication.
- Enhance your ability to write professionally by creating organized reports.

**UNIT I CONVERSATION** **9**

Listening: Listening to informal conversations, Speaking: Short conversations in varied situations in student life, Reading: Reading Short text and longer passages for comprehension at deeper levels, Writing: Writing reviews (book / film), Grammar: Compound Nouns - Numerical Expression, Vocabulary: Cause and Effect Expressions.

**UNIT II LANGUAGE IN USE** **9**

Listening: Listening to Situation based Dialogues, Speaking: Asking about Routine actions and giving directions, Reading: Reading a short story for appreciation and understanding, Writing: Writing Emails - Dialogue writing, Grammar: Purpose expressions - Adverbs, Vocabulary: Imperative sentences.

**UNIT III ENGLISH FOR SPECIFIC PURPOSE** **9**

Listening: Listening strategies for deeper understanding, Speaking: Using dictionary for learning pronunciation, stress and syllable divisions, Reading: an article from Newspaper - Critical reading, Writing: Note-Making / Note-Taking - Essay writing, Grammar: Definition, Degrees of Comparison, Vocabulary: Model verbs.

**UNIT IV ENGLISH FOR CAREER** **9**

Listening: Listening to the interviews of CEOs / entrepreneur, Speaking: Group Discussion skills, Reading: pre reading and post reading tasks, Writing - Job application - Cover letter & Resume, Grammar: Active and Passive voice, Relative Pronouns, Vocabulary: Synonyms and Antonyms.

**UNIT V REPORT WRITING** **9**

Listening: Listening and making notes, Speaking: Discussion on problems and solutions (case studies), Reading: Reading abstracts / Journal Articles, Writing: Minutes of meeting, Reports (Feasibility / Accident / Survey Report), Grammar: If Clause, Vocabulary: Idioms and their Meanings.

**TOTAL: 45 PERIODS**

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**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Respond to informal conversations with effectiveness, exhibiting understanding.
- Appreciate and critically engage with short stories, articulating insights.
- Utilize dictionaries to comprehend syllable structures and pronounce words correctly.
- Engage in healthy group discussions by answering peers' questions and sharing ideas.
- Acquire constructive criticism in case study by describing issues.

**TEXT BOOKS:**


1. Bhatnagar, Nitin and Bhatnagar, Mamta, "Communicative English for Engineering and Professionals", Pearson Education India, 2010.


**REFERENCES:**


1. Raman, Meenakshi and Sharma, Sangeetha, "Technical Communication Principles and Practice", Oxford University Press, Delhi, 2019.
2. Andrea J, Rutherford. "Basic Communication Skills for Technology", Pearson Education, Inc., 2013.
3. Rizvi M, Ashraf. "Effective Technical Communication", Tata McGraw Hill Education Pvt.Ltd., Delhi,2017.


**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | 1 | - | - | 2 | 3 | - | 2 |
| CO2 | - | - | 1 | - | - | 2 | 2 | - | 3 | - | 2 |
| CO3 | - | - | - | - | 2 | - | 2 | - | 3 | - | - |
| CO4 | - | - | - | 2 | - | - | 2 | 3 | 3 | - | - |
| CO5 | - | 2 | - | 2 | - | 2 | 2 | 2 | 3 | - | - |

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| 24MA201 | VECTOR CALCULUS AND COMPLEX INTEGRATION (Common to CSE, ADS and IT) | L T P C 3 1 0 4 |
|---|---|---|

**OBJECTIVES:**

**The Student should be made to:**

- Grasp the fundamental ideas of vectors, vector fields, and scalar fields.
- Identify the field of engineering in ODE as an effective tool for resolving practical issues.
- Interpret the geometric implications of analytic functions in terms of conformal mapping.
- Examine the Contour integration using a variety of complex analysis techniques.
- Compute the inverse Laplace transform and interpret its significance in the time domain.

**UNIT I VECTOR CALCULUS** **9+3**

Gradient of a Scalar point function - Divergence, Curl, Solenoidal and irrotational of a vector point function - Directional Derivative - Green's, Gauss divergence and Stoke's theorems (without proof).

**UNIT II ORDINARY DIFFERENTIAL EQUATIONS** **9+3**

Higher order linear differential equations with constant coefficients $(e^{ax}V, x^nV)$ - Method of variation of parameters - Cauchy's linear differential equations - Legendre's linear differential equations.

**UNIT III ANALYTIC FUNCTIONS** **9+3**

Functions of a complex variable - Analytic functions: Necessary condition - Cauchy-Riemann equations and sufficient condition (excluding proofs) Harmonic and orthogonal properties of analytic function - Construction of analytic functions by Milne's method - Conformal mapping $(w=z+k, 1/z, kz)$ - Bilinear transformation.

**UNIT IV COMPLEX INTEGRATION** **9+3**

Taylors and Laurent's series expansions - Singular points - Residues - Cauchy's residue theorem (excluding proof) - Evaluation of real definite integrals as contour integrals around unit circle and semi-circle (excluding poles on the real axis).

**UNIT V LAPLACE TRANSFORM** **9+3**

Transforms of elementary functions - Basic properties - Shifting theorems - Initial and final value theorems - Transform of periodic functions - Inverse transforms + Convolution theorem - Solution of linear second order ordinary differential equations with constant coefficients.

**TOTAL: (45+15) PERIODS**

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BoS (S&H) 19/02/25

**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Understand the concepts of gradient, divergence, and curl in vector calculus.
- Interpret the suitable techniques for solving second and higher-order differential equations.
- Utilize conformal mapping and analytic functions to transform complex functions between different domains.
- Recognize the significance of singularities and residues in evaluating complex integrals.
- Evaluate the Laplace transform as an inverse transform for simple functions and analyze its properties.

**TEXT BOOKS:**

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition, 2017.
2. Kreyszig Erwin, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2018.

**REFERENCES:**

1. Bali.N.P, and Manish Goyal " A Text Book of Engineering Mathematics", laxmi Publications(P) Ltd., 9th Edition, 2014.
2. Ramana B V "Higher Engineering Mathematics", New Delhi Tata McGraw- Hill Education India Private Limited., 2021.
3. Srimanta Pal and Subodh C Bhunia "Engineering Mathematics", Oxford. 2015.
4. Glyn James, "Advanced Modern Engineering Mathematics", 3rd Edition, Pearson Education, 2012.

**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 1 | - | - | - | - | - | 2 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | 2 |
| CO3 | 3 | 3 | 3 | - | 3 | - | - | - | - | - | 1 |
| CO4 | 3 | 2 | 2 | 1 | 1 | 1 | - | - | - | - | 1 |
| CO5 | 3 | 3 | 2 | 2 | 1 | - | - | - | - | - | 2 |

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BoS (S&H) 19/02/25

| 24MA202 | VECTOR CALCULUS AND NUMERICAL ANALYSIS<br>(Common to BME, EEE and ECE) | L T P C<br>3 1 0 4 |
|---|---|---|

**OBJECTIVES:**

**The Student should be made to:**

- Grasp the fundamental ideas of vectors, vector fields, and scalar fields.
- Identify the field of engineering in ODE as an effective tool for resolving practical issues.
- Interpret the geometric implications of analytic functions in terms of conformal mapping.
- Differentiate the concepts of numerical differentiation and integration procedures, which have significant role in the field of engineering.
- Test the numerous approaches and strategies for resolving different kinds of ODEs.

**UNIT I VECTOR CALCULUS** **9+3**

Gradient of a Scalar point function – Divergence, Curl, Solenoidal and irrotational of a vector point function – Directional Derivative – Green's, Gauss divergence and Stoke's theorems (without proof)

**UNIT II ORDINARY DIFFERENTIAL EQUATIONS** **9+3**

Higher order linear differential equations with constant coefficients ($e^{ax}V, x^nV$) – Method of variation of parameters – Cauchy's linear differential equations- Legendre's linear differential equations

**UNIT III ANALYTIC FUNCTIONS** **9+3**

Functions of a complex variable – Analytic functions: Necessary condition – Cauchy-Riemann equations and sufficient condition (excluding proofs) Harmonic and orthogonal properties of analytic function – Construction of analytic functions by Milne's method – Conformal mapping ($w = z + k, 1/z, kz$) – Bilinear transformation.

**UNIT IV NUMERICAL DIFFERENTIATION AND INTEGRATION** **9+3**

Newton's forward and backward difference formulae – Approximation of derivatives using interpolation polynomials – Numerical integration using Trapezoidal, Simpson's 1/3 rule – Evaluation of double integrals by Trapezoidal and Simpson's 1/3 rules.

**UNIT V NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS** **9+3**

Single Step methods - Taylor's series method – Euler's method – Fourth order Runge-Kutta method for solving first order equations – Multi step methods – Milne's predictor corrector methods for solving first order equations.

**TOTAL: (45+15) PERIODS**

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BoS (S&H) 20/02/25

**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Understand the concepts of gradient, divergence, and curl in vector calculus.
- Interpret the suitable techniques for solving second and higher-order differential equations.
- Utilize conformal mapping and analytic functions to transform complex functions between different domains.
- Apply the different approaches and strategies for solving first- and second-order ordinary differential equations.
- Develop the multi-step methods for solving initial value problems.

**TEXT BOOKS:**


1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition, 2017.
2. Burden, R.L and Faires, J.D, "Numerical Analysis", 9th Edition, Cengage Learning, 2018.


**REFERENCES:**


1. Kreyszig Erwin, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2018.
2. O'Neil, P.V. "Advanced Engineering Mathematics", Cengage Learning India Pvt., Ltd, 7th Edition New Delhi, 2013.
3. Sankara Rao. K., "Numerical Methods for Scientists and Engineers", Prentice Hall of India Pt.Ltd, 4th Edition, New Delhi, 2021.
4. Gerald. C.F., and Wheatley. P.O. "Applied Numerical Analysis" 7th Edition, Pearson Education India, 2017.


**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 1 | - | - | - | - | - | 2 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | 2 |
| CO3 | 3 | 3 | 3 | - | 3 | - | - | - | - | - | 1 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 1 | - | - | - | - | 2 |
| CO5 | 3 | 3 | 2 | 3 | 2 | - | - | - | - | - | 2 |

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BoS (S&H) 19/12/25

| 24MA203 | VECTOR CALCULUS AND STATISTICS<br>(Common to Civil, Mech and AGE) | L T P C<br>3 1 0 4 |
|---|---|---|

**OBJECTIVES:**

**The Student should be made to:**

- Grasp the fundamental ideas of vectors, vector fields, and scalar fields.
- Identify the field of engineering in ODE as an effective tool for resolving practical issues.
- Interpret the geometric implications of analytic functions in terms of conformal mapping.
- Differentiate knowledge of hypothesis testing to small and large samples that play an important role in real-life problems.
- Analyze differences among group means, while controlling the Type I error rate.

**UNIT I VECTOR CALCULUS** **9+3**

Gradient of a Scalar point function - Divergence, Curl, Solenoidal and irrotational of a vector point function - Directional Derivative - Green's, Gauss divergence and Stoke's theorems (without proof)

**UNIT II ORDINARY DIFFERENTIAL EQUATIONS** **9+3**

Higher order linear differential equations with constant coefficients $(e^{ax}V, x^nV)$ - Method of variation of parameters - Cauchy's linear differential equations - Legendre's linear differential equations

**UNIT III ANALYTIC FUNCTIONS** **9+3**

Functions of a complex variable - Analytic functions: Necessary condition - Cauchy-Riemann equations and sufficient condition (statement only) Harmonic and orthogonal properties of analytic function - Construction of analytic functions by Milne's method - Conformal mapping $(w = z + k, 1/z, kz)$ - Bilinear transformation.

**UNIT IV TESTING OF HYPOTHESIS** **9+3**

Statistical hypothesis - Large sample tests based on Normal distribution for single mean and difference of means - Small sample tests based on t distributions for testing of means and F distributions for testing of variances - Chi-square - Contingency table (test for Independency) - Goodness of fit.

**UNIT V ANALYSIS OF VARIANCE** **9+3**

One way classifications - two way classifications - Completely randomized design -Randomized block design - Latin square design

**TOTAL: (45+15) PERIODS**

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BoS (S&H) 19/12/25

**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Understand the concepts of gradient, divergence, and curl in vector calculus.
- Apply suitable techniques for solving second and higher-order differential equations.
- Utilize conformal mapping and analytic functions to transform complex functions between different domains.
- Formulate the null and alternative hypotheses based on research questions and real-life scenarios.
- Classify the one-way and two-way ANOVA and interpret their applications in statistical analysis.

**TEXT BOOKS:**


1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition, 2017.
2. Richard A. Johnson., "Probability and Statistics for Engineers", Pearson Education, 8th Edition, 2019.


**REFERENCES:**


1. Kreyszig Erwin, "Advanced Engineering Mathematics", John Wiley and Sons, 10th
2. Edition, New Delhi, 2018.
3. O'Neil, P.V. "Advanced Engineering Mathematics", Cengage Learning India Pvt., Ltd, 7th Edition New Delhi, 2013.
4. Devore. J.L.,"Probability and Statistics for Engineering and the Sciences, Cengage Learning, New Delhi, 8th Edition, 2021.
5. Spiegel Schiller "Probability and Statistics" Tata McGraw-Hill Publishing Company Limited, New Delhi. 3rd Edition, 2018.


**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 1 | - | - | - | - | - | 2 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | 2 |
| CO3 | 3 | 3 | 3 | - | 3 | - | - | - | - | - | 1 |
| CO4 | 3 | 3 | - | 3 | 2 | - | - | - | - | - | 2 |
| CO5 | 3 | 3 | 2 | 3 | 2 | 1 | - | - | - | - | 2 |

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BoS (S&H) 19/02/25

| 24MC002 | UNIVERSAL HUMAN VALUES 2 - UNDERSTANDING HARMONY<br>(Common to All Branches) | L T P C<br>2 1 0 3 |
|---|---|---|

**OBJECTIVES:**

**The students should be made to:**

- Demonstrate an understanding of ethical principles and human values
- Apply critical thinking to analyze ethical dilemmas and conflicts
- Communicate effectively about ethical issues and human values
- Appreciate the importance of harmony in personal, social, and environmental contexts
- Engage in practices that promote ethical behavior and societal harmony

**UNIT 1 INTRODUCTION TO VALUE EDUCATION 6+3**

Value Education – need and process, Self-Exploration – process, Basic Human Aspirations - Continuous Happiness and Prosperity, Basic requirement for fulfilment of Human Aspirants, Understanding Happiness and Prosperity – Continuity of Happiness from Physical Facility.

**UNIT II HARMONY IN THE HUMAN BEING 6+3**

Human being as a co-existence of the self and the Body - The needs of Self and Body, Body as an Instrument - The Self as the Seer- Doer-Enjoyer, Harmony in the self, Harmony of the Self with the Body –Programme for Self – regulation and health.

**UNIT III HARMONY IN THE FAMILY AND SOCIETY 6+3**

Family as the basic unit of human interaction , Understanding Relationship, Trust as the foundational value, Respect as the Right Evaluation, Harmony in the society – Understanding Human Goal, Harmony from Family Order to World Family Order – Universal Human Order - Scope.

**UNIT IV HARMONY IN THE NATURE AND EXISTENCE 6+3**

Nature - as Collections of Units, Classification of Units into Four Orders, Interconnectedness, and mutual fulfilment among the four orders of nature, self-regulation in Nature, Understanding Existence as Units in Space, Existence as Co-existence.

**UNIT V IMPLICATIONS OF THE ABOVE HOLISTIC UNDERSTANDING OF HARMONY ON PROFESSIONAL ETHICS 6+3**

Natural Acceptance of Human Values - Definitiveness of Ethical Human Conduct, Basis for Humanistic Education, Constitution, Universal Human Order, Competence in Professional Ethics, Holistic Technologies, Production System and Management Models – Typical case, Strategies for Transition towards value based life and profession.

**TOTAL: (30+15) PERIODS**

**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Understand the significance of value education and distinguish between values and skills
- Understand the concept of harmony within the self and how it relates to human values
- Analyze the role of family and society in fostering harmony
- Evaluate the relationship between human values and harmony in nature
- Develop skills to resolve conflicts and promote harmony in personal and professional life

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BoS (S&H) 02/07/25

**TEXT BOOKS:**

1. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics, Excel Books, New Delhi, 2nd Revised Edition, 2019.

**REFERENCES:**


1. Tripathi A N, "Human Values", New Age Intl. Publishers, New Delhi, 2009.
2. Govindarajan M, Natrajan S and Senthilkumar V S, "Engineering Ethics (Including HumanValues)" Eastern Economy, PHI, 12th Edition, 2011.
3. Govindarajan M and Natrajan S, "Professional Ethics and Human Values", PHI, 2011.
4. Banerjee B P, "Foundation of Ethics and Management", Excel Publication, 2005.
5. Bajpai B L, "Indian Ethos and Modern Management", New Royal Book Co, Lucknow,Reprinted 2008.
6. Seebauer and Robert L Berry, "Fundamentals of Ethics for Scientist and Engineers", OxfordUniversity Press, 2000.


**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | - | 3 | 3 | - | - | - | 3 |
| **CO2** | - | - | - | - | - | 3 | 3 | - | - | - | 3 |
| **CO3** | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 |
| **CO4** | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 |
| **CO5** | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 |

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| 24CY201 | ENVIRONMENTAL SCIENCES<br>(Common to All Branches) | L T P C<br>3 0 0 3 |
|---|---|---|

**OBJECTIVES:**

**The students should be made to:**

- Understand the structure and function of different ecosystems and concepts of biodiversity.
- Recognize the causes and effects of environmental pollutants and disaster management.
- Explore the natural resources and their sustainability.
- Examine the principles of sustainable development and Green Chemistry.
- Analyze the impacts of population on environment and human health.

**UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 9**

Definition, scope and importance of environment - concept of an ecosystem - structure and function of an ecosystem - ecological succession - food chain - food web - structure and function of the (a) forest ecosystem (b) desert ecosystem (c) aquatic ecosystem - (pond and ocean) - Biodiversity: Hot spots of biodiversity - threats to biodiversity - values of biodiversity - endangered and endemic species - conservation of biodiversity: In-situ and ex-situ conservation methods.

**UNIT II ENVIRONMENTAL POLLUTION AND NATURAL CALAMITIES 9**

Definition - causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Marine pollution (d) Noise pollution (e) Nuclear hazards - solid waste and E-waste Management: role of an individual in prevention of pollution-disaster management: flood, earthquake, cyclone and landslides.

**UNIT III NATURAL RESOURCES 9**

Forest resources: deforestation, mining, dam and their effects on forest and tribal people - Water resources: Use and over - utilization of surface and ground water - dams-benefits and problems - Food resources: World food problems - effects of modern agriculture - fertilizer - pesticide problems, water logging, salinity - Energy resources: renewable energy sources - Solar energy, Tidal energy, Wind energy sources. Land resource: land degradation, Soil erosion and desertification - role of an individual in conservation of natural resources.

**UNIT IV SOCIAL ISSUES AND SUSTAINABILITY 9**

Water conservation - rain water harvesting- resettlement and rehabilitation of people; its problems and concerns - environmental ethics - acid rain, ozone layer depletion - waste land reclamation - Air (Prevention and Control of Pollution) act - Water (Prevention and control of Pollution) act - Wildlife protection act – Forest conservation act. Sustainable development- Green Chemistry: Principles of green chemistry - Environmental Impact Assessment. Sustainable habitat: Green buildings, Green materials, Energy efficiency, Sustainable transportation.

**UNIT V HUMAN POPULATION AND THE ENVIRONMENT 9**

Population growth, variation among nations - population explosion - family welfare programme - environment and human health - value education - HIV / AIDS - threatening of communicable diseases for human population and its prevention - women and child welfare - role of information technology in environment and human health.

**TOTAL: 45 PERIODS**

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BoS (S&H) 19/02/25

**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Articulate the significance of ecosystems and biodiversity.
- Evaluate the preventive measures of pollution and calamities.
- Identify the strategies for the conservation of natural resources.
- Retrieve the measures of green chemistry to real-world scenarios.
- Evaluate the issues of overpopulation and communicable diseases on the environment.

**TEXT BOOKS:**


1. Benny Joseph, "Environmental Science and Engineering", Tata McGraw-Hill, Delhi, 2nd Edition, 2018.
2. Gilbert M. Masters, "Introduction to Environmental Engineering and Science", Pearson Education Pvt., Ltd., 3rd Edition, 2016.


**REFERENCES:**


1. G. Tyler Miller, St. Andrews Preshyterian, "Introduction to Environmental Science", Cengage Learning India Pvt., Ltd., 2010.
2. Dharmendra S. Sengar, "Environmental Law", Prentice hall of India Pvt. Ltd, Delhi, 2007.


**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | - | - | - | 3 | 2 | - | - | - | - |
| CO2 | 2 | 2 | - | - | - | 3 | 3 | - | - | - | - |
| CO3 | - | 1 | 3 | - | 2 | 3 | - | - | - | - | - |
| CO4 | 2 | - | 3 | - | 3 | - | 3 | - | - | - | - |
| CO5 | 1 | 2 | - | - | - | 2 | - | - | 2 | - | - |

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BoS (S&H) 19/02/25

## 24GE101 COMPUTER FUNDAMENTALS AND C PROGRAMMING

**(Common to All Branches)**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

**OBJECTIVES:**

**The Student should be made to:**

- Learn the fundamentals of Computer and Programming.
- Understand the basics of C programming and decision making statements.
- Learn how to construct programs using array and pointer.
- Understand the concept of string and function.
- Study the concept of structure, union and files.

### UNIT I FUNDAMENTALS OF COMPUTER AND PROGRAMMING 9

Computer System - Components of Computer Hardware - Data Representation - Number System and Conversion - Program Development Life Cycle - Algorithm - Control Structures - Flowchart – Pseudo code - Programming Paradigms.

### UNIT II BASICS OF C PROGRAMMING 9

Overview of C - C Character Set - Identifiers and Keywords - Variable Declaration - Data types - Type Qualifiers and Type Modifiers - Structure of a C Program - Executing a C Program - Operators and Expressions - Decision-Making and Looping Statements.

### UNIT III ARRAYS AND POINTERS 9

Introduction to Arrays - Types of Array - Pointers - void Pointer - Null Pointer - Arrays of Pointers - Pointer to a Pointer - Pointer to an Array - Pointer Arithmetic.

### UNIT IV STRINGS AND FUNCTIONS 9

Strings - Reading String Input - String Library Functions - Command Line Arguments - Functions: Types - Declaration - Definition - Function Call - Pass by Value - Pass by Reference - Passing arrays to functions - Recursion.

### UNIT V STRUCTURE, UNION AND FILES 9

Structures - Pointers to Structures - Array of Structures - Structures within a Structure - Functions and Structures - Unions - Storage Classes - Files: Streams - File type - File operations.

**TOTAL: 45 PERIODS**

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BoS (IT)

27/11

**OUTCOMES:**

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

- Explain the fundamentals of computer and programming.
- Choose appropriate data types, variables and statements for solving simple problems.
- Construct programs using arrays and pointers for a given scenario.
- Build programs using strings and functions in C language.
- Develop programs using structure, union and files for a given scenario.

**TEXT BOOKS:**


1. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", Pearson India Education Services Pvt. Ltd., 2016.


**REFERENCES:**


1. Ajay Mital, "Programming in C - A Practical Approach", Pearson Education, 2015.
2. Dromey R G, "How to Solve it by Computer", Pearson Education, Fifteenth Impression, 2014.
3. Herbert Schildt, "C - The Complete Reference", Tata McGraw-Hill, 2013.
4. Ashok N Kamthane, "Computer Programming", Pearson Education, Second Edition, 2012.
5. Juneja B L and Anita Seth, "Programming in C", Cengage Learning India Pvt. Ltd., 2011.


**Mapping of COs with POs:**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 2 | - | 2 | - | - | - | - | - | - | - |
| CO2 | 3 | 2 | 2 | 2 | - | - | - | - | 2 | 2 | - |
| CO3 | 3 | 2 | 2 | 2 | - | - | - | - | 2 | 2 | 1 |
| CO4 | 3 | 2 | 2 | 2 | 2 | - | - | - | 2 | 2 | 1 |
| CO5 | 3 | 2 | 2 | 2 | 2 | - | - | - | 2 | 2 | 1 |

N. Ramesh

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## 24BM201 BIOSCIENCES FOR BIOMEDICAL ENGINEERING

**L T P C**
**3 0 0 3**

**OBJECTIVES:**

**The student should be made to**

- Apply biochemical principles to understand their roles in biological and clinical systems
- Utilize Carbohydrate and Lipid principles to understand their structure, function, and metabolic activities
- Integrate Amino acids, Proteins, and Nucleic acid concepts to understand their structure, functions, and significance.
- Implement the concepts of Cell injury, Repair, and Neoplasia to understand the factors influencing disease progression
- Utilize Microscopy, Microbiology, and Immunology concepts to assess Microbes, Viruses, and Immune responses.

### UNIT I FUNDAMENTALS OF BIOCHEMISTRY 9

Introduction to Biochemistry, water as a biological solvent, weak acid and bases, pH, buffers, Maintenance of Blood pH,Handerson - Hassel Balch equation, Energy in living organism, Properties of water and their applications in biological systems .Osmosis: Definition, measurement of Osmotic pressure , Biological membrane, Clinical application of Electrolytes and radioisotopes.

### UNIT II CARBOHYDRATES AND LIPIDS 9

Carbohydrates: Classification of carbohydrates – monosaccharide's-Glucose, oligo and polysaccharides. Structure and properties of carbohydrates- Functions of carbohydrates. Lipids: Classification of lipids-Functions. Fatty acids- Nomenclature of Fatty acids-Phospholipids-Glycolipids-Lipoproteins-Amphipathic Lipids and their biological significance.

### UNIT III AMINO ACIDS AND PROTEINS 9

Amino acids: Classification – Based on structure and chemical nature, nutrition and solubility properties of amino acids, Functions of amino acids. Proteins: Classification- Structure-primary, secondary and tertiary. Properties of proteins, Nucleotides and Nuclei acids: Structural aspects – Functions – DNA- Watson-Crick model of DNA structure- RNA- Types- m-RNA t-RNA.

### UNIT IV CELL DEGENERATION, REPAIR AND NEOPLASIA 9

Cell injury: Reversible cell injury-Mechanism of cell injury , Cell death- Necrosis, Apoptosis, Hypoxia and Ischemia-Intracellular accumulations, Pathological calcification- Dystrophic and Metastatic, Cellular ageing.Repair:Cell regeneration, Factors influencing tissue repair, Wound healing. Neoplasia: Benign and Malignant tumors, genetic and epigenetic of carcinogenesis, Carcinogenic agents and their cellular interactions.

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**UNIT V FUNDAMENTALS OF MICROBIOLOGY AND IMMUNOPATHOLOGY 9**

Microscopes: Light microscope, Electron microscope-TEM & SEM. Bacteria: Morphology, Pathogenicity, Epidemiology and Laboratory Diagnosis. Virus: Morphology, Classification-DNA and RNA virus, Viral Multiplication. Immunity: Types- Innate and Acquired immunity- Antigen and Antibodies - Antigen-Antibody Reactions-Immune Response- Production of antibodies, Hypersensitivity, Immunodeficiency diseases.

**TOTAL: 45 PERIODS**

**OUTCOMES:**

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

- Demonstrate the ability to analyze and solve biochemical problems in biological applications
- Analyze the properties, functions, and clinical relevance of carbohydrates and lipids in energy storage, structure, and signaling.
- Assess the classification, structure, and roles of Amino acids, Proteins, and Ncleic acids in genetics.
- Illustrate the processes of cell damage, regeneration, wound healing, and tumor development
- Evaluate microbial structures, viral replication, and immune functions in disease diagnosis

**TEXT BOOKS:**


1. RAFI MD "Textbook of biochemistry for Medical Student" 4th Edition, Universities Press,Orient Black swan Private Limited - New Delhi 2021.
2. U. Satyanarayana & U. Chakrapani "Biochemistry" 5th Edition , Elsevier, 2019.
3. Ramzi S Cotran, Vinay Kumar & Stanley L Robbins, "Pathologic Basis of Diseases",10th edition: South Asia Edition Elsevier India, 2020.
4. Ananthanarayanan & Panicker, "Microbiology" Orient black swan, 10th edition, 2017.


**REFERENCES:**


1. Keith Wilson & John Walker, "Practical Biochemistry -Principles & Techniques", Oxford University Press, 2009.
2. Dubey R C and Maheswari DK. "A Text Book of Microbiology" S Chand & Company Ltd, 2007.
3. Prescott , Harley and Klein, "Microbiology", 10th edition, Mc Graw Hill, 2017


**COURSEOUTCOME Versus PO&PSO MAPPING** (DETAILED; HIGH:3; MEDIUM:2; LOW:1)**:**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 1 | 1 | - | 2 | 1 | - | - | - | 2 | 2 | 2 |
| CO2 | 3 | 2 | - | 1 | - | 2 | 1 | - | - | - | 2 | 2 | 2 |
| CO3 | 3 | 1 | 1 | 1 | - | 2 | 1 | - | - | - | 1 | 2 | 2 |
| CO4 | 3 | 1 | 1 | 1 | - | 2 | - | - | - | - | 2 | 2 | 2 |
| CO5 | 3 | 2 | 1 | 1 | - | 2 | 1 | - | - | - | 2 | 2 | 2 |

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| 24CE201 | ENGINEERING MECHANICS | L | T | P | C |
|---|---|---|---|---|---|
| | (Common to Civil and Mech) | 3 | 1 | 0 | 4 |

**OBJECTIVES:**

**The Students should be made to:**

- Understand the basic concepts of statics of particles, forces and moments.
- Evaluate the various forces involved in rigid bodies.
- Solve problems related to first and second moment of area of different sections.
- Develop knowledge to analyze the various frictional forces.
- Analyze different types of dynamics and kinematics motion in particles.

**UNIT I STATICS OF PARTICLES** **12 (9+3)**

Introduction - Units and dimensions - Laws of mechanics - Lami's theorem, Parallelogram and triangular law of forces - Vectorial representation of forces and moments - Coplanar forces - Resolution and composition of forces -Free body diagram - Equilibrium of a particle - Forces in space - Equilibrium of a particle in space - Equivalent systems of forces - Principle of transmissibility.

**UNIT II STATICS OF RIGID BODIES** **12 (9+3)**

Moment of a force about a point and about an axis - Vectorial representation of moments and couples - Scalar components of a moment - Varignon's theorem -Types of supports and their reactions - Moments and couples - Equilibrium of rigid bodies in two dimensions.

**UNIT III PROPERTIES OF SURFACES AND MASS** **12 (9+3)**

First moment of area, centroid of sections –Simple, Compound sections and Hollow sections- Second moment of plane areas – Simple, compound sections and Hollow sections - Parallel axis theorem and perpendicular axis theorem – Polar moment of Inertia – Product of Inertia – Introduction to mass moment of inertia of plane area.

**UNIT IV KINETICS AND KINEMATICS** **12 (9+3)**

Frictional force - Laws of coulomb friction –Sliding friction - Static and Kinetic friction - Belt friction - Ladder friction- Wedge friction-Rolling resistance- Displacement, velocity and relative motion.

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**BoS(Civil)** 22/02/25

**UNIT V DYNAMICS OF PARTICLES & KINEMATICS OF RIGID BODIES** **12 (9+3)**

Rectilinear motion - Curvilinear motion - Newton's law- D'Alembert's Principle - Work energy equation of particles - Impulse and momentum –Impact of elastic bodies -Translation and rotation of rigid Bodies - General plane motion of simple rigid bodies such as cylinder and sphere.

**TOTAL: 60 PERIODS**

**OUTCOMES:**

**On successful completion of this course, the students will be able to:**

- Illustrate vectorial representation of forces and moments.
- Evaluate statics of rigid bodies in equilibrium.
- Analyze various properties of surfaces and masses.
- Determine various frictional forces applying laws of friction.
- Solve dynamic forces, kinematics of rigid bodies and its effects.

**TEXT BOOKS:**


1. Kottiswaran N, "Engineering Mechanics – Statics & Dynamics", Sri Balaji Publications11th Edition, 2017
2. Palanichamy, M.S., Nagan S., "Engineering Mechanics - Statics & Dynamics", Tata McGraw- Hill, 3rd Edition, 2006.


**REFERENCE BOOKS:**


1. Parthasarathi NS and Vela Murali, "Engineering Mechanics", Oxford University Press, 2016.
2. Irving H. Shames and Krishna Mohana Rao. G., "Engineering Mechanics - Statics and Dynamics", 4th Edition, Pearson Education,2006.
3. Meriam J.L. and Kraige L.G., "Engineering Mechanics" - Statics-Volume 1, Dynamics-Volume Third Edition, John Wiley & Sons, 9th Edition, 2018.
4. Beer, Jhonston, Cornwell and Sanghi, "Vector mechanics for engineers: statics and dynamics", Twelfth Edition, McGraw Hill Education,2019.


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Mapping of COs with POs and PSOs

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | 2 |
| CO2 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | 2 |
| CO3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | 2 |
| CO4 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | 2 |
| CO5 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | 2 |

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BoS(Civil) 22/02/25

| 24AD201 | PYTHON PROGRAMMING<br>(Common to ADS, CSE, IT and BME) | L T P C<br>3 0 0 3 |
|---|---|---|

**OBJECTIVES:**

**The Student should be made to:**

- Acquire knowledge about the fundamentals of Python language
- Learn to solve problems using Python conditionals , loops and use functions to solve problems
- Apply Python data structures - lists, tuples and dictionaries to represent complex data
- Enhance the knowledge in GUI Programming
- Build application that handles files and exceptions

**UNIT I INTRODUCTION TO PYTHON** 9

Programming Languages - Python History - Getting Started with Python - Writing a Simple program - Reading input from console - Identifiers - Variables - Simultaneous Assignments - Constants - Data Types and Operators - Operator Precedence - Evaluating expressions - Augmented Assignment operators - Type conversion - Common Python Functions - Strings and Characters - Formatting Numbers and Strings.

**UNIT II CONTROL STATEMENTS AND FUNCTIONS** 9

Selections: if - Two way if-else - Nested if and multi-way if-elif-else Statements - Loops: while - for - Nested Loops - break and continue - Function: Definition - Calling and Returning values - Positional and keyword arguments - Passing arguments by reference values - Scope of variables - Default Arguments - Recursion.

**UNIT III DATA STRUCTURES IN PYTHON** 9

List Basics - List Methods - Passing List to Functions - Returning a List from function - Tuples - Sets - Comparing Sets and Lists - Dictionaries.

**UNIT IV GUI PROGRAMMING USING PYTHON** 9

Introduction - Getting started with TKinter - Processing Events - The widget Classes - Canvas - The Geometry Managers. Combo Boxes - Menus - Pop-up menus - Mouse, key, Events and Bindings. Case Study: Bouncing Balls - Scrollbars - Standard Dialog Boxes.

**UNIT V FILES AND EXCEPTION HANDLING** 9

Introduction - Text Input and Output - File Dialogs - Retrieving Data from the Web - Exception Handling - Raising Exceptions - Processing Exception using Exception Objects.

**TOTAL: 45 PERIODS**

**OUTCOMES:**

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

- Understand the basics of python programming languages
- Apply basic Python programs that solve issues by utilizing loops and conditionals
- Demonstrate compound data using Python lists, tuples and dictionaries etc
- Implement solutions using GUI Programming in Python
- Develop programs by using files and exception handling for the given scenario

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BoS (AD) 26/11

**TEXT BOOKS:**

1. Y.Daniel Liang, "Introduction to Python Programming and Data Structures", 3rd Edition Pearson Education, 2023.

**REFERENCES:**


1. Timothy A. Budd, "Exploring Python", McGraw Hill Education (India) Private Ltd, 2017.
2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd Edition, Updated for Python 3, Shroff / O'Reilly Publishers, 2016. (http://greenteapress.com/wp/think-python/)
3. Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Inter-disciplinary Approach", Pearson India Education Services Pvt. Ltd., 2016.
4. Mark Lutz, "Learning python", O'Reilly Publication, 5th Edition, 2013.
5. Guido Van Rossum and Fred L. Drake Jr, "An Introduction to Python", Revised and Updated for Python 3.2, Network Theory Ltd., 2011.


**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 3 | 2 | - | - | - | 2 | - | - | 3 |
| **CO2** | 3 | 3 | 3 | 3 | 3 | - | - | - | - | 2 | - |
| **CO3** | 3 | 2 | 3 | - | - | - | - | 2 | - | - | 2 |
| **CO4** | 3 | 2 | 3 | - | 2 | - | - | 2 | - | - | 3 |
| **CO5** | 3 | 2 | 3 | - | - | - | - | 2 | - | - | 2 |

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BoS (AD)

**24EC201 ELECTRIC CIRCUITS AND ELECTRON DEVICES**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

**OBJECTIVES:**

**Student should be made to**

- Understand the basic electrical quantities, circuit elements, and fundamental laws governing electrical circuits.
- Able to simplify electrical circuits using various network theorems and two-port parameter concepts.
- Learn the behavior of RL, RC, and RLC circuits under transient conditions using Laplace transform techniques.
- Provide insights into semiconductor diodes, their characteristics, and applications in electronic circuits.
- Explore the working principles of BJTs, JFETs, and MOSFETs, along with their role in amplification and switching circuits

**UNIT I BASIC CIRCUIT ANALYSIS** **9**

Electrical Quantities -Basic Circuit Elements -Independent Voltage and Current Sources - Ohm's Law- Kirchhoff's Laws -Voltage and Current Division, Source Transformation Star Delta Conversion- Mesh analysis and Nodal analysis for DC Circuits - Fundamentals of AC Circuits.

**UNIT II NETWORK THEOREMS AND TWO PORT NETWORKS** **9**

Network Theorems for DC Circuits: Thevenin's Theorem Norton's Theorem- Superposition Theorem Maximum Power Transfer Theorem Two Port Networks: Z Parameters – Y Parameters - h Parameters - Relationships between Network Parameters (Z, Y, h).

**UNIT III TRANSIENT RESPONSE ANALYSTS** **9**

Introduction to Laplace transform for step, impulse and periodic functions-Transient Response of RL, RC and RLC Circuits using Laplace transform for DC input and AC sinusoidal input.

**UNIT IV SEMICONDUCTOR DIODES AND DEVICES** **9**

Classification of Semiconductors – PN Junction Diode -Structure, Operation and V-I characteristics -Diode Current equation -Transition and Diffusion Capacitances Zener Diode LED-Photodiode-Solar Cell -UJT-SCR.

**UNIT V TRANSISTORS** **9**

Bipolar Junction Transistor: Construction of BJT-Operation of NPN and PNP transistor - Input and Output characteristics of CB, CE, CC configuration- Field Effect transistor: JFET P Channel JFET and N Channel JFET Construction, Operation, Drain and Transfer characteristics MOSFET Depletion MOSFET and Enhancement MOSFET - Construction, Operation and characteristics.

**TOTAL :45 PERIODS**

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BOS/ECE 07/03/25

**OUTCOMES:**

**On successful completion of this course, the students be able to,**

- Recognize fundamental circuit laws and theorems to solve DC electrical circuits.
- Illustrate the use of Thevenin's, Norton's, and Superposition theorems for circuit simplifications.
- Interpret the behavior of RL, RC, and RLC circuits under DC and AC inputs using Laplace Transform techniques.
- Examine the characteristics and functions of diodes, Zener diodes, LEDs, photodiodes, solar cells, and thyristors
- Categorize the working principles, characteristics, and applications of BJTs, JFETs, and MOSFETs in different circuit configurations

**TEXT BOOKS:**


1. S. Salivahanan, "Circuit Theory Analysis and Synthesis", Pearson Education,1 st Edition,2021.
2. S. Salivahanan, "Electronic Devices", Tata McGraw Hill, 1st Reprint Edition, 2014.


**REFERENCES:**


1. Sudhakar A and Shyam Mohan SP, "Circuits and Network Analysis and Synthesis", 5 thEdition, McGraw Hill, 2015.
2. Chakrabarti A, "Circuit Theory (Analysis and synthesis), Revised Edition, Dhanpath Rai & Sons, New Delhi, 2017.
3. Balbir Kumar, Shail. B. Jain, "Electronic devices and circuits", 2nd Edition PHI learning private limited, 2014.
4. David A. Bell, "Electronic devices and circuits", 5th Edition, Oxford University Higher education, 2008.
5. Sedra and Smith, "Microelectronic circuits", 7th Edition, Oxford University Press, 2017
6. Thomas L. Floyd, "Electronic devices" Conventional current version, 10th Edition, Pearson prentice hall, 2017.


**Mapping of COs with POs and PSOs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | - | - | - | 2 | 2 | 1 |
| CO2 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | - | - | - | 2 | 2 | 1 |
| CO3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | - | - | - | 2 | 2 | 1 |
| CO4 | 3 | 2 | 1 | 1 | - | 1 | 1 | - | - | - | 2 | 2 | 1 |
| CO5 | 3 | 2 | 1 | 1 | - | 1 | 1 | - | - | - | 2 | 2 | 1 |

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| 24EE201 | CIRCUIT THEORY | L T P C |
|---|---|---|
| | | 3 1 0 4 |

**OBJECTIVES:**

**The students should be made to:**

- Solve AC and DC circuit using network reduction technique
- Impart knowledge on solving circuit using network theorems
- Know the concept of resonance and coupled circuits
- Understand the transient response of various AC and DC circuits
- Acquire knowledge on polyphase circuits and techniques for measuring power

**UNIT I BASIC CIRCUITS ANALYSIS** **9+3**

Electrical quantities – Network elements – R, L and C parameters – Energy sources – Ohm's law – Kirchhoff's laws – Power in series circuits – Resistors in series and parallel – Mesh and Nodal analysis for AC and DC circuits – Dependent sources – Fundamentals of AC circuits.

**UNIT II NETWORK REDUCTION AND THEOREMS FOR DC AND AC CIRCUITS** **9+3**

Network reduction: Voltage and current division, Source transformation – Star delta conversion. Thevenin's and Norton's theorem – Superposition theorem – Maximum power transfer theorem – Millman's theorem – Tellegan's theorem.

**UNIT III RESONANCE AND COUPLED CIRCUITS** **9+3**

Resonance: Series and parallel resonance – Resonant frequency of tank circuit – Quality factor and Bandwidth. Coupled circuits: Self and mutual inductance – Coefficient of coupling. Tuned circuits: Single tuned circuits. Analysis of magnetic circuits – Composite series and parallel magnetic circuits.

**UNIT IV TRANSIENT RESPONSE ANALYSIS** **9+3**

Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and AC sinusoidal input – Introduction to Laplace transform for step, impulse and periodic functions.

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BoS (EEE)

**UNIT V POLYPHASE CIRCUITS** **9+3**

Analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced and unbalanced – Phasor diagram of voltages and currents – Power and power factor measurement in the three phase circuits.

**TOTAL: 45+15 PERIODS**

**OUTCOMES:**

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

- Understand the fundamentals of electric circuit
- Apply various theorems for analyzing AC and DC circuits
- Acquire knowledge about resonant, tuned, and coupled circuits
- Analyze the transient behavior of electrical circuits
- Summarize the operation of polyphase circuits and power measurements

**TEXT BOOK:**


1. Sudhakar A and Shyam Mohan S P, "Circuits and Networks: Analysis and Synthesis", 5th Edition, McGraw Hill, 2017.


**REFERENCES:**


1. Chakrabarti A, "Circuit Theory (Analysis and Synthesis)", Revised Edition, Dhanpath Rai and Co., 2023.
2. Salivahanan S, "Circuit Theory Analysis and Synthesis", 1st Edition, Pearson Education, 2021.
3. Charles K Alexander, Matthew N O Sadiku, "Fundamentals of Electric Circuits", McGraw-Hill Education, 6th Edition, 2019.
4. William H Hayt, Jack Kemmerly, Steven Durbin M, "Engineering Circuit Analysis", McGraw Hill Publications, 8th Edition, 2013.
5. Robins and Miller, "Circuit Analysis: Theory and Practice", Delmar Publishers, 5th Edition, 2012.


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BoS (EEE)

**Mapping of COs with POs, PSOs:**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 2 | 3 | 3 |
| **CO2** | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 2 | 3 | 3 |
| **CO3** | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 2 | 3 | 3 |
| **CO4** | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 2 | 3 | 3 |
| **CO5** | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 2 | 3 | 3 |

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BoS (EEE)

**24AG201 PRINCIPLES AND PRACTICES OF CROP PRODUCTION**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

**OBJECTIVES:**

**The students should be made to:**

- Introduce the basic principles of agriculture and crop production
- Familiarize in crop selection and establishment procedures
- Impart basic knowledge on nutrient, pest and disease management for better crop production
- Learn the cultivation practices of various field crops
- Understand the cultivation practices of horticultural crops

**UNIT I AGRICULTURE AND CROP PRODUCTION** **9**

Introduction to agriculture – History and Scope of agriculture in India – Agricultural sectors and Allied sectors – Field crop production and Horticulture – Principles of agronomy – Classification of crops – Cropping seasons – Factors affecting crop growth and production: genetic (internal) and environmental (external) factors – Crop management through environmental modification and adaptation of crops to the existing environment through crop cultural practices.

**UNIT II CROP SELECTION AND ESTABLISHMENT** **9**

Regional and seasonal selection of crops – Systems of crop production – Competition among crop plants – Spacing and arrangement of crop plants – Field preparation for crops including systems of tillage – Seed: seed selection, seed treatment, sowing and planting – Nursery production – Intercultural operations.

**UNIT III CROP MANAGEMENT** **9**

Crop water management – Crop Nutrition Management – sources of nutrients, generalized recommendation, methods and timing of applications – Crop protection: Weed, Pest and Disease management – Integrated methods of managing water, nutrients and plant protection – Harvesting: Types and methods of harvesting.

**UNIT IV PRODUCTION PRACTICES OF FIELD CROPS** **9**

Package and practices for important field crops – Cereals: Paddy, Maize – Pulses / Grain legumes: Red gram, Black gram and Green gram – Oil seeds: Groundnut and Gingelly – Sugar crops: Sugarcane – Fibre crops: Cotton – Special purpose crops such as those grown for green manure and fodder.

**UNIT V PRODUCTION PRACTICES OF HORTICULTURAL CROPS** **9**

Package and practices horticultural crops in Tamilnadu such as – Vegetable crops: Tomato, Chilli, Bhendi and Brinjal – Fruit crops: Mango and Banana – Flower crops: Jasmine and Chrysanthemum – Green house cultivation of horticultural crops.

**TOTAL: 45 PERIODS**

V. Gore

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BoS (AGE) 03/04/25

**OUTCOMES:**

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

- Understand the basic principles of successful crop production with an engineering approach
- Apply engineering knowledge in field preparation practices for enhanced productivity
- Assess the different management techniques, including engineering-based solutions to control pest and diseases
- Analyze the field crop production practices with an engineering perspective
- Explain the innovative engineering techniques applied in the cultivation of horticultural crops

**TEXT BOOKS:**


1. Rajendra Prasad, "Textbook of Field Crops Production, Volume 1 and 2", Indian Council of Agricultural Research, New Delhi, 2017.
2. Reddy S R, "Principles of Agronomy", Kalyani Publishers, New Delhi, 2018.


**REFERENCES:**


1. Crop Production Guide, Tamilnadu Agricultural University Publication, Coimbatore, 2020.
2. Kumar N, "Introduction to Spices, Plantation crops, Medicinal and Aromatic plants", Oxford and IBH Publishing Co. Pvt. Ltd., 2nd Edition, 2018.
3. Kumar N, "Introduction to Horticulture", Medtech Publications, 8th Edition, 2018.


**Mapping of COs with POs and PSOs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | - | - | - | - | - | - | 2 | 2 | - |
| CO2 | 3 | - | - | - | - | - | - | - | - | - | 2 | 2 | 2 |
| CO3 | 3 | 2 | 2 | 1 | 2 | 2 | - | - | - | - | 2 | 2 | 2 |
| CO4 | 3 | - | - | 1 | 2 | 2 | - | 1 | - | 1 | 2 | 2 | 2 |
| CO5 | 3 | - | - | 1 | 2 | 2 | - | 1 | - | 1 | 2 | 2 | 2 |

V. GOPI

CHAIRMAN
BoS (AGE) 03/04/25

| 24TA201 | TAMILS AND TECHNOLOGY<br>(Common to All Branches) | L T P C<br>1 0 0 1 |
|---|---|---|

**OBJECTIVES:**

**Students should be made to:**

- Gain knowledge about weaving and ceramic Technology
- Creating a design and construction Technology
- Analyzing manufacturing Technology
- Applying agriculture and irrigation Technology
- Remembering scientific and scientific Tamil and Tamil computing

**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

Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo -Saracenic architecture at Madras during British Period.

**UNIT III MANUFACTURING TECHNOLOGY** 3

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting, steel -Copper and gold- Coins as source of history - Minting of Coins – Beads making-industries Stone beads - Glass beads - Terracotta beads -Sheil beads/ bone beats - Archeological evidences - Gem stone types described in Silappathikaram.

**UNIT IV AGRICULTURE AND IRRIGATION TECHNOLOGY** 3

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** 3

Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project.

**TOTAL: 15 PERIODS**

**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Understand weaving under ceramic Technology.
- Develop new design and construction Technology.
- Identify the manufacturing Technology.
- Understand agriculture and irrigation.
- Knowledge of scientific Tamil and Tamil computing.

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**TEXT-CUM-REFERENCE BOOKS**

1. தமிழகவரலாறு - மக்களும்பண்பாடும் – கே. கே. பிள்ளை– (வெளியீடு:தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் - முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை -ஆற்றங்கரை நாகரீகம். (தொல்லியல் துறை வெளியீடு).
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 the river Vaigai' (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu.)
10. Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu.)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | 2 | 1 | - | - | 1 |
| CO2 | - | - | - | - | - | - | 2 | 1 | - | - | 1 |
| CO3 | - | - | - | - | - | - | 2 | 1 | - | - | 1 |
| CO4 | - | - | - | - | - | - | 2 | 1 | - | - | 1 |
| CO5 | - | - | - | - | - | - | 2 | 1 | - | - | 1 |

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BoS (S&H) 19/02/25

| 24TA201 | தமிழரும் தொழில்நுட்பமும்<br>(அனைத்து துறைகளுக்கும் பொதுவானது) | L T P C<br>1 0 0 1 |
|---|---|---|

**நோக்கம்:**

**மாணவர்கள் கண்டிப்பாக அறிய வேண்டுவன**:

- நெசவு மற்றும் பீங்கான் தொழில்நுட்பம் பற்றிய அறிவைப் பெறுதல்.
- வடிவமைப்பு மற்றும் கட்டுமான தொழில் நுட்பத்தை உருவாக்குதல்.
- உற்பத்தி தொழில் நுட்பத்தை பகுப்பாய்வு செய்தல்.
- விவசாயம் மற்றும் நீர்ப்பாசனத் தொழில் நுட்பத்தைப் பயன்படுத்துதல்.
- அறிவியல் மற்றும் அறிவியல் தமிழ் மற்றும் தமிழ் கணிப்பொறி தொடர்பான அறிவை நினைவில் கொள்ளுதல்.

**அலகு 1 நெசவு மற்றும் பானை தொழில் நுட்பம்** 3

சங்க காலத்தில் நெசவுத்தொழில் - பானை தொழில் நுட்பம் - கருப்பு, சிவப்பு பாண்டங்கள் - பாண்டுகளில் கீறல் குறியீடுகள்.

**அலகு 2 வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்** 3

சங்ககாலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் &சங்ககாலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு - சங்க காலத்தில் கட்டுமான பொருட்களும் நடுக்கல்லும் - சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் - மாமல்லபுரச் சிற்பங்களும், கோவில்களும் - சோழர் காலதது பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் நாயக்கர் கால கோயில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - செட்டிநாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ - சாரோசெனிக் கட்டிடக்கலை.

**அலகு 3 உற்பத்தித் தொழில்நுட்பம்** 3

கப்பல் கட்டும் கலை - உலோகவியல் - இரும்பு தொழிற்சாலை - இரும்பை உருக்குதல், எஃகு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடிகள் - மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள் - எலும்பு துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

**அலகு 4 வேளாண்மை மற்றும் நீர்ப்பாசன தொழில்நுட்பம்** 3

அணை, குளங்கள், மதகு - சோழர்கால குமுளி தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப்பு - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன்வளம் - முத்து மற்றும் முத்து குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவுசார் சமூகம்.

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BoS (S&H) 19/02/25

**அலகு 5 அறிவியல் தமிழ் மற்றும் கணித்தமிழ்** 3

அறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின்பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக் கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத் திட்டம்.

**TOTAL: 15 PERIODS**

**முடிவுகள்:**

**பாடத்தின் முடிவில், மாணவர்கள் அறிந்து கொள்வன:**

- பீங்கான் மற்றும் நெசவு தொழில்நுட்பத்தைப் புரிந்து கொள்ளுதல்.
- புதிய வடிவமைப்பு மற்றும் கட்டுமான தொழில் நுட்பத்தை உருவாக்குதல்.
- உற்பத்தித் தொழில் நுட்பத்தை அடையாளம் காணுதல்.
- விவசாயம் மற்றும் நீர்ப்பாசனத்தைப் புரிந்து கொள்ளுதல்.
- அறிவியல் தமிழ் மற்றும் தமிழ் கணிப்பொறி தொடர்பான அறிவை பெறுதல்.

**உரை மற்றும் குறிப்பு புத்தகங்கள்:**


1. தமிழகவரலாறு - மக்களும்பண்பாடும் – கே. கே. பிள்ளை– (வெளியீடு : தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் - முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை -ஆற்றங்கரை நாகரீகம். (தொல்லியல் துறை வெளியீடு).
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 the river Vaigai' (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu.)
10. Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu.)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.


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BoS (S&H) 19/12/25

**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | - | - | 2 | 1 | - | - | 1 |
| **CO2** | - | - | - | - | - | - | 2 | 1 | - | - | 1 |
| **CO3** | - | - | - | - | - | - | 2 | 1 | - | - | 1 |
| **CO4** | - | - | - | - | - | - | 2 | 1 | - | - | 1 |
| **CO5** | - | - | - | - | - | - | 2 | 1 | - | - | 1 |

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| 24GE103L | C PROGRAMMING LABORATORY<br>(Common to All Branches) | L | T | P | C |
|---|---|---|---|---|---|
| | | 0 | 0 | 3 | 1.5 |

**OBJECTIVES:**

**The Student should be made to:**

- Learn how to develop C programs using conditional and looping statements
- Understand the concept of functions, arrays and strings
- Learn how to access memory using pointers
- Group different kinds of data related to a single entity
- Understand the manipulation of data in permanent storage

**LIST OF EXPERIMENTS:**

1. Programs using decision making statements.
2. Programs using looping statements.
3. Programs using user defined functions and recursive functions.
4. Programs using one dimensional and two dimensional arrays.
5. Solving problems using string functions.
6. Programs using pointers and dynamic memory allocation.
7. Programs using structures and unions.
8. Programs using pointers to structures and other data types.
9. Programs using text files.
10. Programs using binary files.

**TOTAL: 45 PERIODS**

**OUTCOMES:**

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

- Implement C programs using control statements.
- Write C programs using functions, arrays and strings.
- Write C programs to access data in memory using pointers.
- Develop C programs using structures and other user defined data structures to manipulate heterogeneous data.
- Build C programs to manipulate data stored on permanent storage.

**List of Equipment for a Batch of 30 Students:**

- Standalone desktops with C compiler or Server with C compiler for 30 Nos.

**Mapping of COs with POs :**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 3 | 2 | - | - | - | 2 | 3 | - | - |
| CO2 | 3 | 2 | 3 | 2 | - | - | - | 2 | 3 | - | - |
| CO3 | 3 | 2 | 3 | 2 | - | - | - | 2 | 3 | - | 2 |
| CO4 | 3 | 2 | 3 | 2 | 2 | - | - | 2 | 3 | - | 2 |
| CO5 | 3 | 2 | 3 | 2 | 2 | - | - | 2 | 3 | - | 2 |

CHAIRMAN
BoS (IT) 27/11

| 24BM202L | BIOSCIENCES LABORATORY | L T P C<br>0 0 3 1.5 |
|---|---|---|

**OBJECTIVES:**

**The students should be made to:**

- Experiment with various laboratory solution, buffers and emulsions and standardize by using spectroscopy
- Identify the presence of Carbohydrates, Proteins, and Lipids in the given samples
- Demonstrate blood collection and preparation of Serum and Plasma
- Analyze biochemical parameters in the blood and Urine for clinical assessment
- Apply staining techniques to analyze Microorganisms and Pathological samples

**LIST OF EXPERIMENTS:**

1. Preparation of solutions: a) percentage solutions, b) molar solutions, c) normal solutions
2. Standardization of pH meter, preparation of buffers, emulsions.
3. Spectroscopy: Determination of absorption maxima ($\lambda_{max}$) of a given solution
4. General tests for carbohydrates, proteins and lipids.
5. Identification of blood sample Collection and Preparation of serum and plasma from blood.
6. Estimation of Glucose, Creatinine, Urea and Uric acid
7. Urine physical and chemical examination (protein, reducing substances, ketones, bilirubin and blood)
8. Study of Staining Techniques
    a) Simple staining.
    b) Gram Staining.
    c) AFB Staining
9. Study of Histopathological slides of benign and malignant tumors and Haematology slides of anemia and leukemia.
10. Antigen – Antibody reaction immune electrophoresis.

**TOTAL: 45 PERIODS**

**COURSE OUTCOMES**

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

- Develop solution for testing, standardize based on pH values and use Spectroscopy effectively for analysis
- Detect and differentiate between Carbohydrates, Proteins, and Lipids from the biological samples
- Differentiate and process Serum and Plasma effectively
- Perform tests for determining the values of complete Glucose, Creatinine, Urea, Uric Acid, and Urine components
- Evaluate histopathological and hematology slides for disease identification

**Text Books:**

1. Textbook of Medical Laboratory Technology, Ramnik Sood, 6thEdition, Jaypee Brothers Medical Publishers, 2009

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**BoS/BME** 21/03/25

**COURSE OUTCOME Versus PO&PSO MAPPING** (DETAILED; HIGH:3; MEDIUM:2; LOW:1):

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | - | - | 3 | 2 | 2 |
| CO2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | - | - | 3 | - | - |
| CO3 | 1 | 1 | 1 | 2 | 1 | - | 1 | 2 | - | - | 3 | - | - |
| CO4 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | - | - | 3 | 2 | 2 |
| CO5 | 2 | 1 | - | - | 1 | - | - | 2 | - | - | 2 | 2 | 2 |

Chairman
BoS/BME

| 24CE202L | BUILDING DRAFTING AND MODELING LABORATORY | L | T | P | C |
|---|---|---|---|---|---|
| | | 0 | 0 | 3 | 1.5 |

**OBJECTIVES:**

The students should be made to:

- Understand the software skills necessary for creating drafts and models of diverse buildings and intricate joinery details
- Analyze RCC isolated footing and stepped footing
- Evaluate plan, elevation and sectional views of industrial buildings
- Explain drafting plan, elevation and sectional views of residential buildings
- Create sectional views of various staircases

**LIST OF EXPERIMENTS**

1. Introduction to building bylaws - Symbols and sign conventions - Components of a typical residential building with load bearing walls – Developing plan, section and elevation of buildings.
2. Principles of planning, orientation and complete joinery details (Panelled and Glazed doors and windows) buildings with sloping roof, steel truss.
3. R.C.C. framed structures with stepped wall footing and isolated RCC Column footing.
4. Industrial buildings - North light roof structures.
5. Single storied residential building.
6. Staircase – Doglegged and open well stairs

**TOTAL: 30 PERIODS**

**OUTCOMES:**

**On successful completion of this course, the students will be able to:**

- Develop 2D and 3D views of buildings and joinery details
- Model different views of RCC isolated footing and stepped footing
- Sketch the North light roof structures of industrial buildings.
- Draw plan, section and elevation of residential building.
- Analyze the doglegged and open well stairs.

**CHAIRMAN**
**BoS (Civil)** 22/02/25

Mapping of COs with POs and PSOs

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 2 | 3 | 2 | - | - | 2 | - | 2 | 3 | 2 |
| CO2 | 2 | 3 | 3 | 2 | 3 | 2 | - | - | 2 | - | 2 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 2 | 2 | 2 | - | - | 2 | - | 2 | 2 | 2 |
| CO4 | 2 | 3 | 3 | 3 | 2 | 2 | - | - | 1 | - | 2 | 2 | 2 |
| CO5 | 2 | 3 | 3 | 2 | 2 | 2 | - | - | 1 | - | 2 | 2 | 2 |

**CHAIRMAN**
**BoS (Civil)**

| 24CE202L | BUILDING DRAFTING AND MODELING LABORATORY | L | T | P | C |
|---|---|---|---|---|---|
| | | 0 | 0 | 3 | 1.5 |

**LIST OF EQUIPMENTS**

Requirements for a batch of 30 students

| S. No. | Description of Equipment/Software | Quantity required |
|---|---|---|
| 1 | Computer System with necessary accessories | 30 Nos |
| 2 | Licensed Software (AUTOCAD) for drafting | 30 Licenses |
| 3 | Printer | 01 No |

CHAIRMAN
BoS (Civil) 22/02/25

| 24AD202L | PYTHON PROGRAMMING LABORATORY<br>(Common to ADS, CSE, IT and BME) | L | T | P | C |
|---|---|---|---|---|---|
| | | 0 | 0 | 3 | 1.5 |

**OBJECTIVES:**

**The Student should be made to:**

- Use control statements and operators in Python programs
- Create python programs using functions and strings
- Represent compound data using Python lists, dictionary and set
- Build python GUI Application with Tkinter
- Design python applications to handles files and exceptions

**LIST OF EXPERIMENTS:**

1. Python Program to constructs conditional statements.
2. Python Program to implement operators and built in functions.
3. Python Program to performing string operations.
4. Python Program to find the factorial of a number by using functions.
5. Python Program to manipulating the elements on list.
6. Python Program to develop a fundamental data structures in programming using dictionary and set.
7. Python program to Controlling Layout with Geometry Managers.
8. Python Program to display the calendar of the year with GUI using Tkinter.
9. Python Program to perform count the number of words in a file.
10. Python Program to implement exception handling.

**TOTAL: 45 PERIODS**

**OUTCOMES:**

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

- Solve the problems using control statements and operators in python
- Construct python program using strings and functions
- Design Python lists, dictionary and set to represent compound data
- Apply Tkinter to develop GUI Application
- Develop python programs using file and exception handling

**List of Equipment for a Batch of 30 Students:**

Standalone desktops with Python 3 interpreter for Windows/Linux 30 Nos.

**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 3 | 2 | 2 | - | - | 2 | - | - | - |
| CO2 | 3 | 3 | 3 | 2 | - | - | - | 2 | - | - | - |
| CO3 | 3 | 2 | 2 | - | - | - | - | 2 | - | - | - |
| CO4 | 3 | 3 | 3 | - | 2 | - | - | 2 | - | - | 2 |
| CO5 | 3 | 3 | 3 | - | 2 | - | - | 2 | - | - | 2 |

CHAIRMAN
BoS (AD) 26/11

**24EC202L** **CIRCUITS AND DEVICES LABORATORY**

| L | P | T | C |
|---|---|---|---|
| 0 | 0 | 3 | 1.5 |

## OBJECTIVES:

The Student should be made to:

- Learn and verify the voltage and current in the electrical circuit using Kirchhoff's laws.
- Apply circuit analysis concepts using network theorems.
- Analyze the operation of RLC circuits in series and parallel models.
- Evaluate the characteristics, behavior under varying conditions, and practical applications of diodes and transistors in electronic circuits and devices.
- Create a project using electronic components.

## LIST OF EXPERIMENTS:

1. Verification of KVL and KCL
2. Verification of Thevinin's and Norton's Theorem
3. Verification of Super Position Theorem
4. Verification of Maximum Power Transfer Theorem
5. Simulation and Verification of Reciprocity Theorem
6. Determination of Resonance Frequency of Series and Parallel RLC Circuits
7. Characteristics of PN Junction Diode and Zener Diode
8. Input-Output Characteristics of CE Configuration
9. Simulation of LED Characteristics
10. Characteristics of FET
11 Characteristics of SCR
12 Mini Project

**TOTAL: 45 PERIODS**

## OUTCOMES:

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

- Contrast Kirchhoff's laws to verify the voltage and current
- Determine the network theorems allows for the efficient solution of voltage, current or resistance in complex circuits.
- Illustrate the operation of RLC circuits in series and parallel models enables the analysis of resistive, inductive and capacitive components
- Implement the characteristics of semiconductor diodes and transistors.
- Demonstrates the ability to design, assemble, and troubleshoot electronic circuits, showcasing problem-solving skills and practical application of electronic principles.

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BoS (ECE) 07/03/25

**Mapping of COs with POs and PSOs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 1 | 1 | - | 2 | - | 2 | 2 | - | 1 | 2 | - |
| CO2 | 3 | 3 | 2 | 1 | 2 | 2 | - | 2 | 2 | - | 1 | 2 | 2 |
| CO3 | 2 | 2 | 3 | 2 | - | 2 | - | 2 | 2 | 1 | 1 | 2 | - |
| CO4 | 2 | 2 | 3 | 2 | 2 | 2 | - | 2 | 2 | 1 | 1 | 2 | 2 |
| CO5 | 2 | 1 | 2 | 1 | - | 2 | - | 2 | 2 | 2 | 1 | 2 | - |

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BoS (ECE)

**Lab Requirement for a Batch of 30 Students**

| | | |
|---|---|---|
| 1 | BC 107, BC 148, BFW10 | 25 Each |
| 2 | 1N4007, SCR, Zener diodes | 25 Each |
| 3 | Resistors, Capacitors, Inductors | Adequate Quantities |
| 4 | Digital Multimeter | 10 Nos |
| 5 | Bread Boards | 15 Nos |
| 6 | Voltmeter (0-15) V, (0-10)V | 10 Nos |
| 7 | Ammeter (0-20) mA, (0-250) μA | 10 Nos |
| 8 | CRO (30MHz) | 10 Nos. |
| 9 | Function Generators (3 MHz) | 10 Nos |
| 10 | Dual Regulated Power Supplies (0 – 30V) | 15 Nos |
| 11 | Standalone desktops PCs with Multisim Software (Equivalent to any open-source Software) | 15 Nos |

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BoS (ECE) 07/03/25

| 24EE202L | ELECTRIC CIRCUITS LABORATORY | L | T | P | C |
|---|---|---|---|---|---|
| | | 0 | 0 | 3 | 1.5 |

**COURSE OBJECTIVES:**

**The students should be able to:**

- Simulate the electric circuit problems
- Solve the electric circuits using various theorems
- Impart knowledge on transient response of electric circuits
- Understand the concept of resonance circuits
- Learn about various three-phase connections

**LIST OF EXPERIMENTS:**

1. Simulation and experimental verification of electrical circuit problems using Kirchhoff's voltage law.
2. Simulation and experimental verification of electrical circuit problems using Kirchhoff's current law.
3. Simulation and experimental verification of electrical circuit problems using Mesh analysis.
4. Simulation and experimental verification of electrical circuit problems using Nodal analysis.
5. Simulation and experimental verification of electrical circuit problems using Thevenin's theorem.
6. Simulation and experimental verification of electrical circuit problems using Norton's theorem.
7. Simulation and experimental verification of electrical circuit problems using Superposition theorem.
8. Simulation and experimental verification of Maximum Power transfer theorem.
9. Simulation and experimental validation of RC transients.
10. Simulation and experimental validation of RLC transients.
11. Design and implementation of series resonance circuits.
12. Simulation of three phase balanced star and delta circuits.

**TOTAL: 45 PERIODS**

CHAIRMAN
BoS (EEE)

## COURSE OUTCOMES:

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

- Understand the fundamental circuit law for DC circuits
- Analyze the circuit problems by using various theorems
- Acquire knowledge of the transient behavior of electric circuits
- Design the resonance circuits
- Interpret various three-phase connections

## Mapping of COs with POs, PSOs:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 2 | - | - | 2 | - | - | 2 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 2 | 2 | - | - | 2 | - | - | 2 | 3 | 3 |
| CO3 | 3 | 3 | 2 | 2 | 2 | - | - | 2 | - | - | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 2 | 2 | - | - | 2 | - | - | 2 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 2 | 2 | - | - | 2 | - | - | 2 | 3 | 3 |

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BoS (EEE)

**24EE202L** **ELECTRIC CIRCUITS LABORATORY**

## LIST OF EQUIPMENTS FOR A BATCH OF 30 STUDENTS

| S. No. | Description of Equipment | Quantity Required (Nos) |
|---|---|---|
| 1. | Personal computers with e-Sim/Scilab/Pspice / MATLAB /other Equivalent software Package | 10 |
| 2. | Printer | 1 |
| 3. | Regulated power supply (0 - 30)V | 10 |
| 4. | Function Generator (3 MHz) | 10 |
| 5. | Cathode Ray Oscilloscope (30 MHz) | 10 |
| 6. | Digital Storage Oscilloscope (50 MHz) | 1 |
| 7. | DC – Voltmeter (0 – 30)V | 10 |
| 8. | DC – Ammeter (0 – 100)mA | 15 |
| 9. | Multimeter | 10 |
| 10. | Decade resistance, inductance and capacitance box | Each 6 |
| 11. | Bread boards | 10 |
| 12. | Resistors and Capacitors of various ranges | As required |
| 13. | Connecting Wires | As required |

CHAIRMAN
BoS (EEE) 26/02/25

| 24ME201L | COMPUTER AIDED DRAFTING LABORATORY | L | T | P | C |
|---|---|---|---|---|---|
| | | 0 | 0 | 3 | 1.5 |

**OBJECTIVES:**

**The student should be made to:**

- Acquire knowledge in engineering drawings, Standard practices with fits and tolerances
- Study the terminologies in two dimensional drawings
- Learn the importance of projection symbols and usage of title blocks
- Gain knowledge in creation of various curves and solids
- Prepare the standard layout for various machine components with Bill of Materials

**DRAWING STANDARDS** **3**

Code of practice for Engineering Drawing, computational dimensioning & tolerancing, paper sizes & fits, Preparation of production drawings and reading of part drawings.

**2-D DRAFTING** **3**

Basic Terminologies-Drawing, Editing, Dimensioning, Line, Curves and Splines, Layering, Hatching, Mirroring, Text and types, Block, Array, Coordinate systems (absolute, relative, polar, etc.), types of sectioning

**CAD PRACTICE** **39**

1. Drawing of a Title Block with necessary text and projection symbol.
2. Drawing of curves like parabola, ellipse, spiral, involute using B-spline or cubic spline.
3. Drawing of front view and top view of simple solids like prism, pyramid, cylinder, cone, and dimensioning.
4. Creation of the Sectional view of assembly for the following:
   Joints: Universal, Knuckle, Gib & Cotter
   Bearing: Bushed Bearing
   Coupling: Muff, Flange
   Engine parts: Piston, Connecting Rod
   Machine Components: Machine Vice, Plummer Block.

**TOTAL: 45 PERIODS**

CHAIRMAN
(BoS / MECH) 31/12

**OUTCOMES:**

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

- Infer engineering knowledge in creation of drawing with Standards
- Select the basic tooling commands of two dimensional drawings
- Create the title block with text and projection symbol
- Construct the various curves and solids in two dimensional drafting
- Develop the sectional views of various machine components with engineering knowledge

**REFERENCES :**


1. Bhatt N D and Panchal V M., "Machine Drawing", Charator Publishers, 51st Edition, 2022.
2. Sidheswar N, Kannaiah P and Sastry .V.V.S., "Machine Drawing", McGraw Hill Education, 2017.


**Mapping of COs with POs and PSOs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 1 | - | 3 | 3 | - | 3 | - | - | 2 | 3 | 2 |
| CO2 | 3 | 2 | 2 | - | 3 | 3 | - | 2 | - | - | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | - | 3 | 3 | - | - | - | - | 2 | 3 | 2 |
| CO4 | 3 | 2 | 1 | - | 3 | 3 | - | 2 | - | - | 2 | 3 | 2 |
| CO5 | 3 | 2 | 2 | - | 3 | 3 | - | 2 | - | - | 2 | 3 | 3 |

CHAIRMAN
(BoS / MECH)

## 24ME201L COMPUTER AIDED DRAFTING LABORATORY

### LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

| S. No | Description of Equipment | Quantity Required |
|---|---|---|
| 1 | Computer System with necessary accessories | 30 Nos. |
| 2 | Licensed software (AUTOCAD) for Drafting | 30 License |
| 3 | Printer | 1 No. |

CHAIRMAN
(BoS / MECH) 31/05

**24AG202L** **CROP HUSBANDRY FIELD LABORATORY** **L T P C**
**0 0 3 1.5**

**OBJECTIVES:**

**The students should be made to:**

- Acquire knowledge to identify and field preparation for field crops and horticultural crops
- Illustrate the seed concept and seed rate requirement
- Impart basic knowledge on nutrient, water, pest and disease management
- Learn the basic principles of crop monitoring
- Understand the science of harvesting and post harvesting

**LIST OF EXPERIMENTS:**

1. Identification of field crops and horticultural crops
2. Studies of field preparation for field crops
3. Studies of Seed selection, sowing and treatment procedures
4. Estimation of seed rate and germination of seeds
5. Studies of Nutrient management
6. Practicing Water management and Irrigation scheduling
7. Practicing different weed management practices
8. Study the integrated pest and diseases management practices
9. Practicing the biometric observation of crops
10. Study the Harvesting and Post harvesting methods

**OUTCOMES:**

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

- Identify the field crops and horticultural crops and their field preparation using engineering principles
- Understand the basic knowledge of seed selection and estimation of seed rate with an engineering approach
- Illustrate the different management practices in crops by integrating agricultural engineering techniques
- Analyze crop monitoring data using engineering knowledge for successful crop production
- Explain the new engineering techniques and tools to harvest the crops

**Mapping of COs with POs and PSOs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | - | - | - | - | - | - | 2 | 2 | - |
| CO2 | 3 | - | - | - | - | - | - | - | - | - | 2 | 2 | - |
| CO3 | 3 | 2 | - | - | 2 | - | - | - | - | - | 2 | 2 | 1 |
| CO4 | 3 | 2 | 2 | - | 2 | - | - | 2 | - | 1 | 2 | 2 | 1 |
| CO5 | 3 | - | - | - | - | - | - | 2 | 1 | 1 | 2 | 2 | 1 |

V.GOPI
CHAIRMAN
BoS (AGE) 03/04/25

**24AG202L** **CROP HUSBANDRY FIELD LABORATORY**

**Requirements for a batch of 30 students**

| | | |
|---|---|---|
| 1. | A wet land / garden land for a minimum of 5 cents area for each / group of students | 01 |
| 2. | An open / borewell as water source to support cultivation | 01 |

V. Gopie

CHAIRMAN
BoS (AGE) 03/04/25

**24EEC201L PROFESSIONAL COMMUNICATION LABORATORY L T P C**
**(Common to All Branches) 0 0 2 1**

**OBJECTIVES:**

**The students should be made to:**

- Establish effective time management techniques and professional grooming routines.
- Make progress on their own presentations by utilizing visual aids and interacting with the audience.
- Obtain the ability to participate in group conversations effectively and comprehend group dynamics.
- Recognize the protocol required for different types of interviews.
- Develop strategies for stress management, time management, and professional networking.

**UNIT I SOFT SKILLS DEVELOPMENT** **6**

Introduction to Soft Skills - Hard skills & soft skills - Employability and Career Skills - Grooming as a professional with values - Time Management - General awareness of Current Affairs.

**UNIT II DEVELOPING SELF ESTEEM** **6**

Self-Introduction-organizing the material - Introducing oneself to the audience - introducing the topic - answering questions - individual presentation practice - presenting the visuals effectively - Five minutes presentation

**UNIT III PROFESSIONAL SKILLS** **6**

Introduction to Group Discussion - Participating in group discussions - understanding group dynamics - brainstorming the topic - questioning and clarifying - GD strategies - activities to improve GD skills

**UNIT IV COMMUNICATION ETIQUETTES** **6**

Interview etiquette - dress code - body language - attending job interviews - telephonic interview - one to one interview & panel interview - FAQs related to job interviews

**UNIT V MANAGEMENT SKILLS** **6**

Recognizing the differences between groups and teams - managing time - managing stress-networking professionally- respecting social protocols - understanding career management-developing a long- term career plan-making career changes.

**TOTAL: 30 PERIODS**

**OUTCOMES:**

**On successful completion of the course, the students will be able to,**

- Develop employability skills such as communication, teamwork, adaptability, and problem-solving.
- Enhance confidence and competence in answering questions effectively during presentations and discussions.
- Apply group discussion techniques and real-world exercises to improve debating abilities.
- Prepare for various job interviews, including panel, one-on-one, and telephone interviews.
- Formulate a comprehensive career plan, focusing on networking and career progression.

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**Mapping of COs with POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | - | - | - | 3 | 3 | - | 3 |
| **CO2** | - | - | - | - | - | - | - | 3 | 2 | - | 3 |
| **CO3** | - | - | - | - | - | - | - | 2 | 3 | - | 3 |
| **CO4** | - | - | - | - | - | - | - | 3 | 3 | - | 3 |
| **CO5** | - | - | - | - | - | - | - | 3 | 2 | - | 2 |

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BoS (S&H) 19/02/25

## LIST OF EQUIPMENTS
**Requirements for a batch of 30 students**

| Sl. No. | Description of Equipment/Software | Quantity required (Nos) |
|---|---|---|
| 1 | Computer | 30 |
| 2 | Headphones | 30 |
| 3 | **Software:** Globarena | 30 |

CHAIRMAN
BoS (S&H) 19/02/25